Basic Weather Spotting

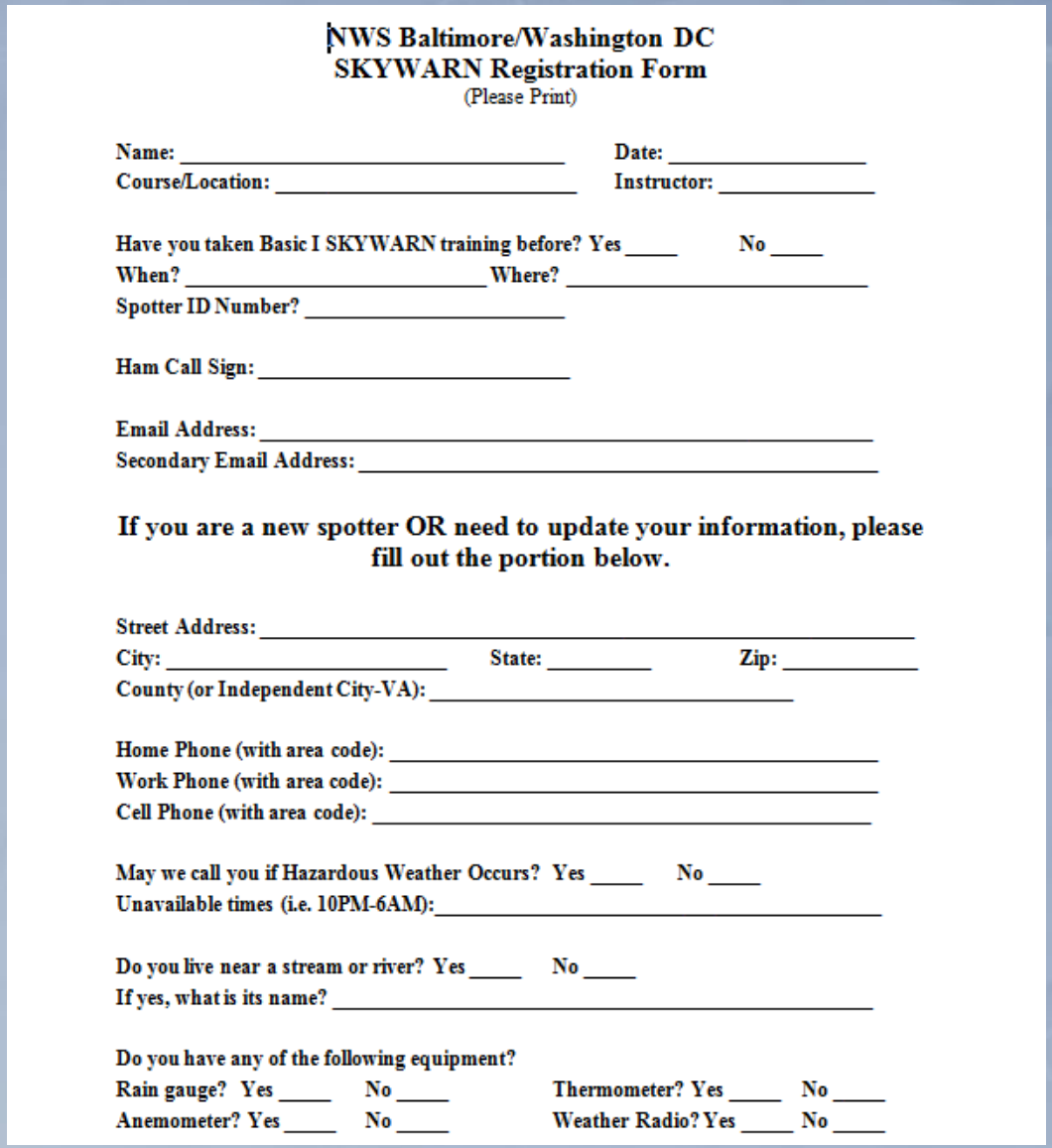
National Weather Service
Baltimore MD/Washington DC

Filling Out Your Registration Form

The information you enter on this form WILL NOT be given out to anyone. You are protected by Federal Privacy Laws.

Spotter numbers are sent out via email. Please write legibly! If we can't read your email address, you might not get your number. Also, check your spam folder settings. The email will come from @noaa.gov

****Please give us 3-4 weeks to input your information and get you a Spotter ID. You can still call/email us during that time****



NWS Baltimore/Washington DC
SKYWARN Registration Form
(Please Print)

Name: _____ Date: _____
Course/Location: _____ Instructor: _____

Have you taken Basic I SKYWARN training before? Yes ____ No ____
When? _____ Where? _____
Spotter ID Number? _____

Ham Call Sign: _____

Email Address: _____
Secondary Email Address: _____

If you are a new spotter OR need to update your information, please fill out the portion below.

Street Address: _____
City: _____ State: _____ Zip: _____
County (or Independent City-VA): _____

Home Phone (with area code): _____
Work Phone (with area code): _____
Cell Phone (with area code): _____

May we call you if Hazardous Weather Occurs? Yes ____ No ____
Unavailable times (i.e. 10PM-6AM): _____

Do you live near a stream or river? Yes ____ No ____
If yes, what is its name? _____

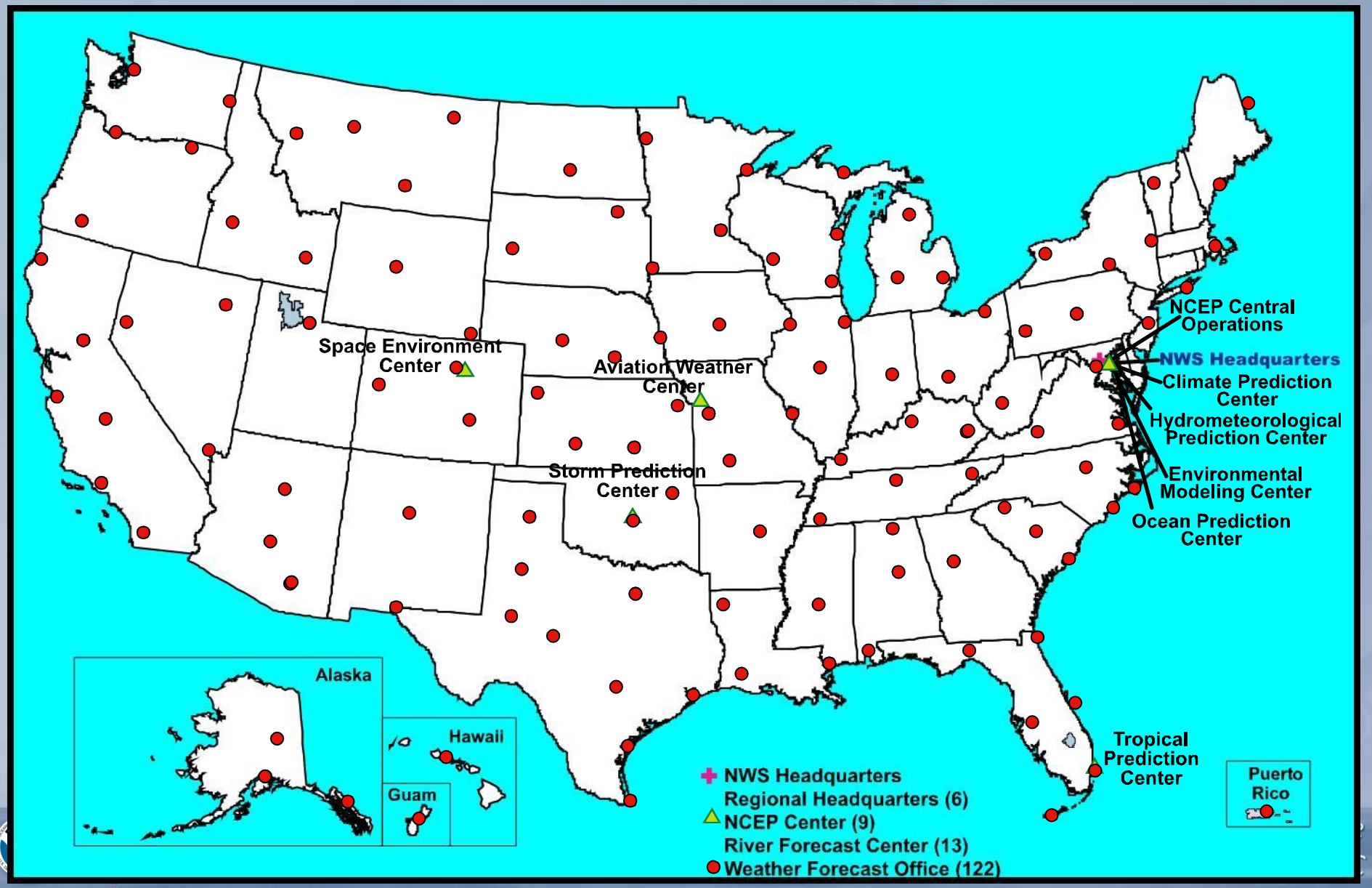
Do you have any of the following equipment?
Rain gauge? Yes ____ No ____ Thermometer? Yes ____ No ____
Anemometer? Yes ____ No ____ Weather Radio? Yes ____ No ____

Today's Topics

- Overview of the NWS
- What Does a Spotter Do?
- How to Report Hazardous Weather
- Operations & Services
- Weather Hazards in the Mid Atlantic
  - Convective
  - Non Convective

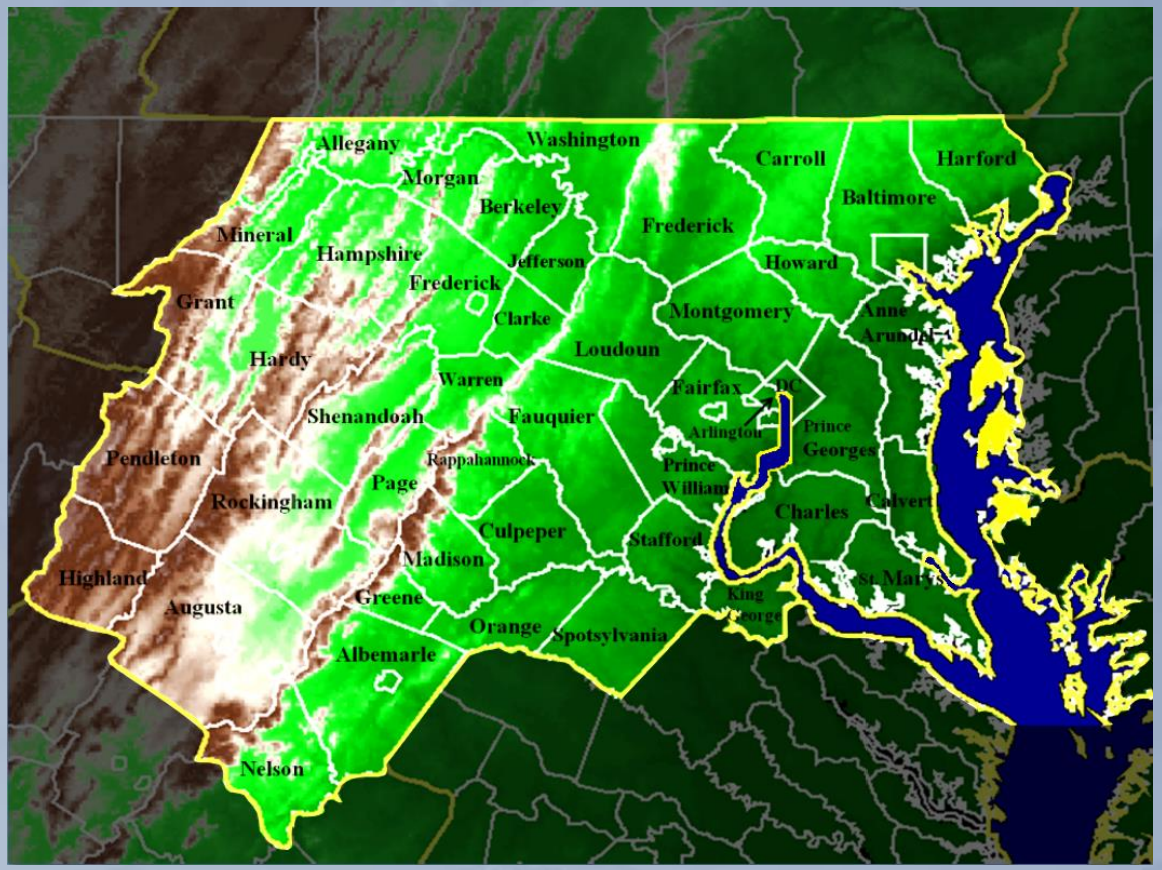
NOAA's NWS Service Delivery

Facilities



Area of Responsibility

- 13 MD Counties
- 8 WV Counties
- 22 VA Counties
  - 11 Independent Cities
- District of Columbia
- The City of Baltimore



…nearly 10 million people to look out for!

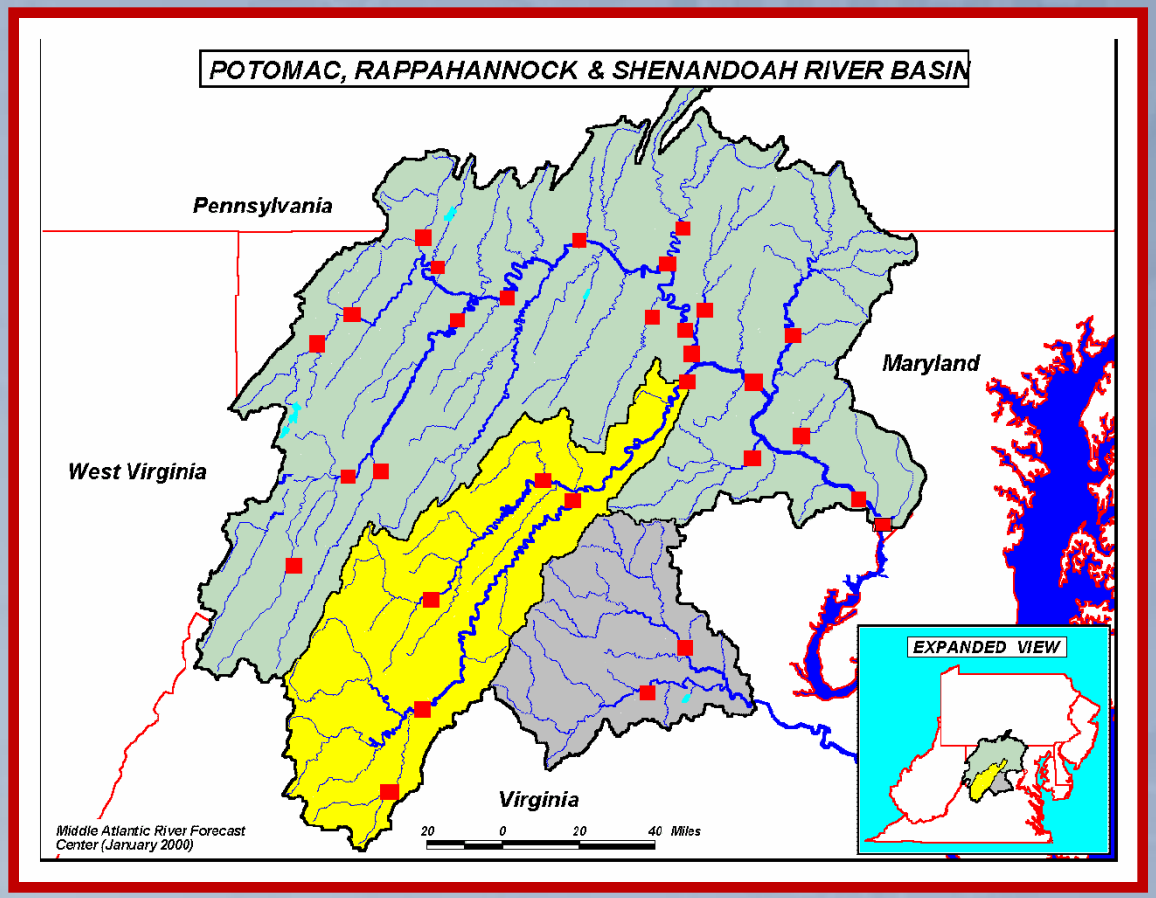
WFO Hydrologic Area of Responsibility

River Basins

Potomac
- 11,600 Square Miles
- 22 Forecast Points

Shenandoah
- 3,050 Square Miles
- 6 Forecast Points

Rappahannock
- 1,580 Square Miles
- 2 Forecast Points



About the National Weather Service

- Provide climate, water, weather forecasts and warnings to **protect life and property**

- Data and products are used by other government agencies, the private sector, the public and the global community

Why Do We Need Spotters?

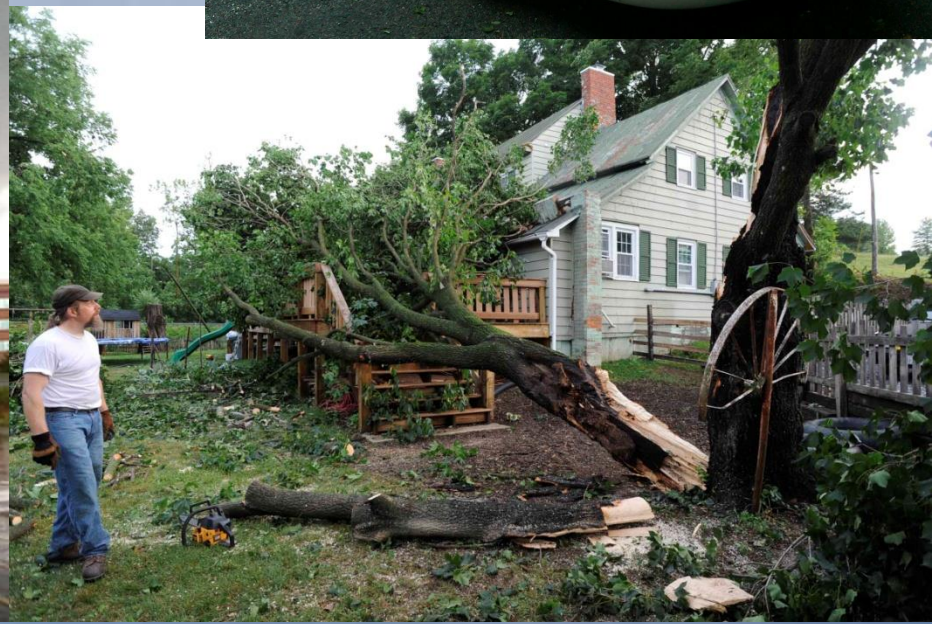
Spotters report observed weather to the NWS during potentially severe weather events.

Remember our mission? The protection of lives and property. We can't do it alone. We need you, the local experts!

The information that you relay to us has the potential to save lives and property – helping us complete our mission.

Spotters Reports Should Contain the Who, What When & Where

- Who is making the report?
- What are you reporting?
- When did the event occur?
- Where is the location of the report?



Reporting Criteria

- **Tornado or Funnel**
- **Hail – Pea sized or larger**
- **Rotation within a storm**
- **Wind – 50 MPH or greater (sustained/gust and measured/estimated)**
- **Damage – Any weather related damage to trees or property. Give as many details as possible.**

Reporting Criteria

- **Heavy Rain** – Measured 1” or More
- **Flooding** – Streams, creeks or rivers out of banks of flooding of roads from poor drainage (including coastal flooding)

- **Ice Accumulation** – Any glaze on surfaces
- **Snow Accumulation** – Every 2” or any accumulation not reflected in the forecast

Making a Report

- Include your **full name and Spotter Number**!

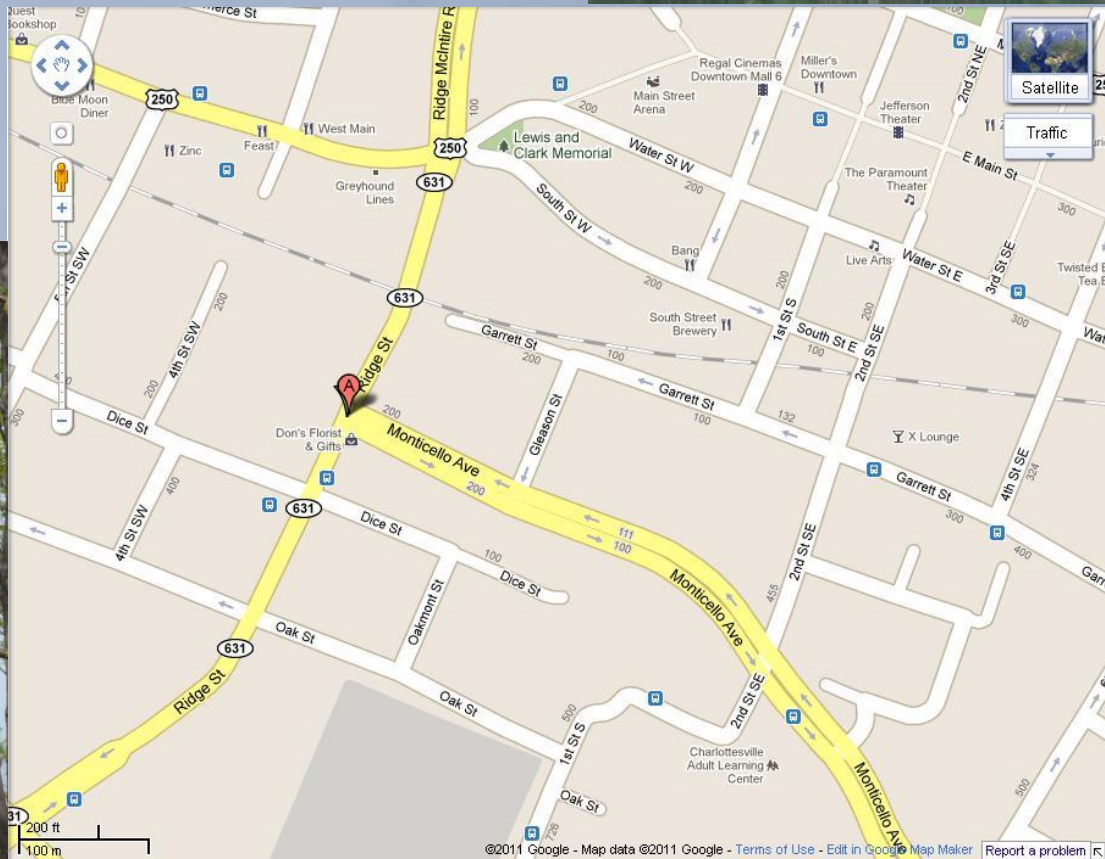
- Be as specific as possible about when the event occurred
  - We can go back and look at archived radar data

- What you are reporting (funnel, downed trees, etc)

Where Was That?

When Referencing Locations

Please be as specific as possible! You are the local expert – we are not as familiar with the roads/cities in your county. **Please reference the nearest intersection or block number, mile marker or even latitude/longitude.**

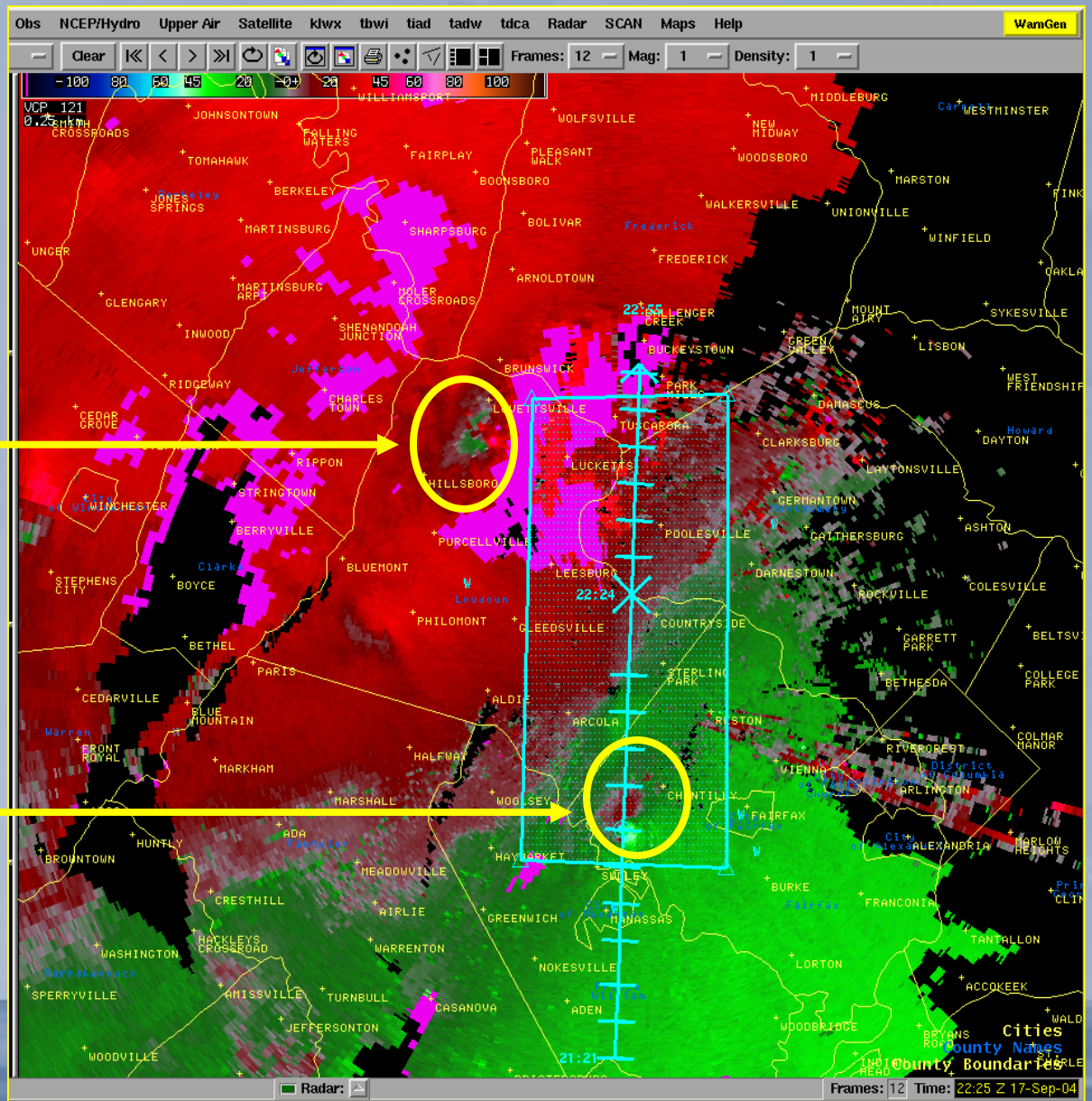


Why is Location So Important?

Storm Based Warnings

Tornado # 2

Tornado #1

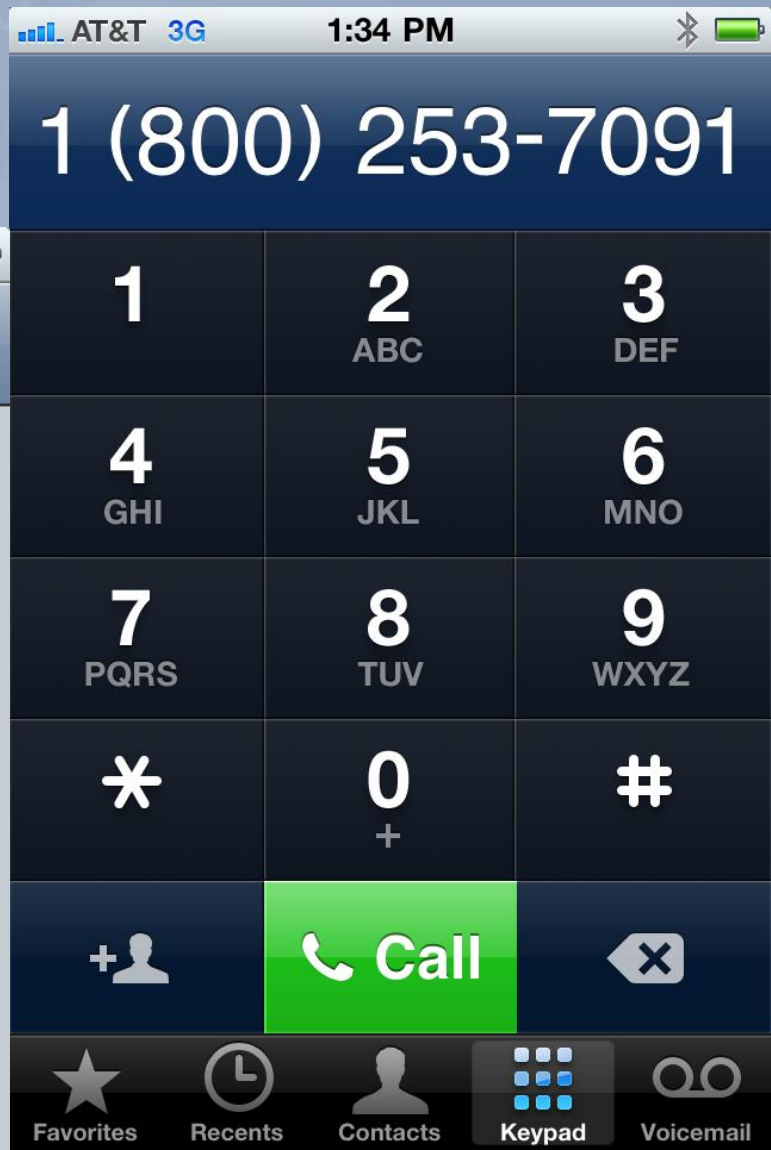


How to Report Information

1. **Call NWS Baltimore/Washington if weather is imminent or occurring:**
   1.800.253.7091 OR 703.996.2201
2. **Email *delayed* weather reports to:**
   lwx-report@noaa.gov
3. **Contact local Emergency Management Officials**
4. **Relay your report through Amateur Radio when activated**

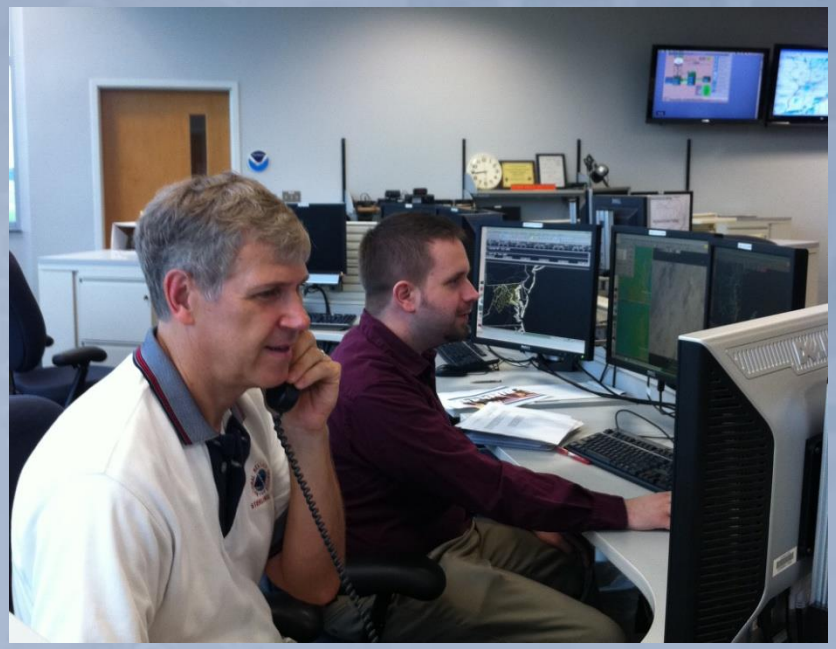
Contact Information

Let's take a minute and input this information into your cell phone.



What Happens to the Reports at the National Weather Service?

1. Received by the staff
2. Integrated with other information (radar, satellite, & spotters)
3. Used to “calibrate” the radar
4. Helps in warning decision
5. The information you provide can be relayed in warnings, and real time storm reports!
6. Web, NOAA Weather Radio, and the media relay the information



It’s all about getting information to the people so they can make the right decisions.

Operations & Services

- Forecasts
  - Public
  - Marine
  - Aviation
  - Fire Weather
  - River
- Support Services
  - Homeland Security
- Data Collection
  - Climate
  - Cooperative Observers

Operations & Services

Watch/Warnings

- Convective
  - Tornado
  - Severe Thunderstorm
- Tropical Systems
  - Hurricanes
  - Tropical Storms
- Non-Precipitable
  - Heat Waves
  - High Wind
  - Wind Chill/Excessive Cold
- Hydrological
  - Flash Floods
  - River Floods
  - Small Stream & Tributaries
- Winter Storms
- Coastal Flooding
- Wildfire (Red Flag)

Operations & Services

Watch/Warnings

- **Warning**
  - Action needed!
  - Threat is imminent or occurring in warning area.
  - Advisory = low level warning
- **Watch**
  - "Watch the weather"
  - Conditions are favorable for the hazard to occur in the near future.
  - Stay tuned for updates.
  - Action may be needed soon.
- **No near term threats**
  - Check Outlook (thru 7 days)

What Happens When We Issue a Warning?

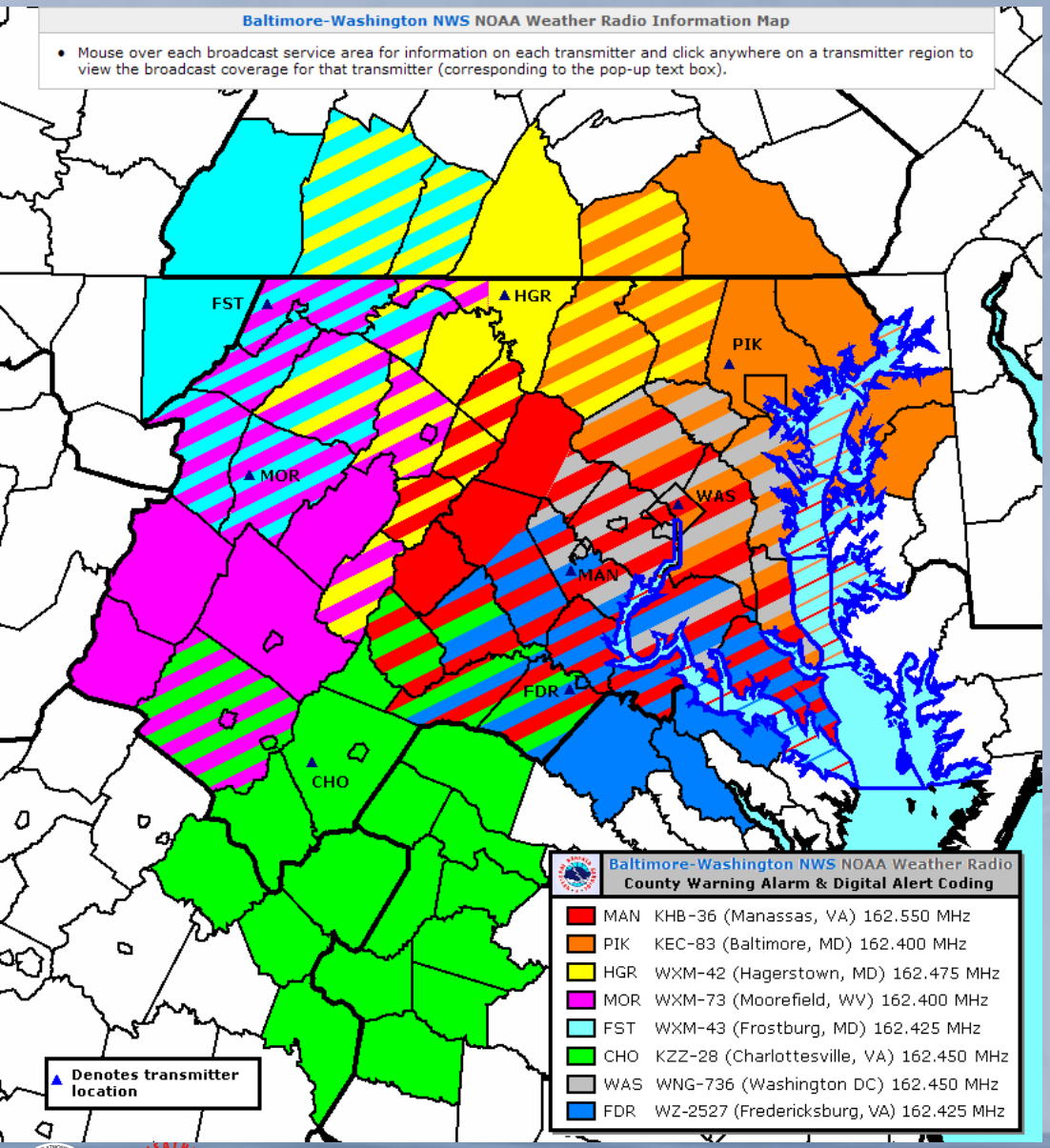
Partners

NWS

PUBLIC

National Weather Service
Baltimore MD/Washington DC

Speaking of NOAA Weather Radio (NWR)…



Is the best way to receive watch and warning information!

Receivers

Can be purchased in Nature and Electronic Stores and in Catalogs. They generally range in price from $15 to $75

Free Phone Service to NWR & the Forecast

Washington DC: 202.349.0185

Manassas, VA: 703.652.1210

Fredericksburg, VA: 540.322.4035

Baltimore, MD: 410.500.4450

National Weather Service
Baltimore MD/Washington DC

Weather Hazards in the Mid Atlantic

- Severe Thunderstorms
  - -Damaging Winds/Hail
- Tornadoes/Waterspouts
- Flooding & Flash Flooding
- Tidal/Coastal Flooding
- Hurricanes
- Winter Weather
- Enhanced Fire Threat

Developing Tornado over Andrews AFB

New NWS Webpage

- Latest Watches/Warnings/ Advisories

- Local Forecast

- **Hazardous Weather Outlook**

weather.gov/washington or weather.gov/baltimore

Hazardous Weather Outlook (HWO)

.DAY ONE...THIS AFTERNOON AND TONIGHT

A TORNADO WATCH IS IN EFFECT UNTIL 8 PM FOR KING GEORGE AND PRINCE WILLIAM COUNTIES. THERE IS A SLIGHT RISK OF SEVERE THUNDERSTORMS THIS AFTERNOON FOR THESE COUNTIES. ANY STORMS THIS AFTERNOON WILL HAVE THE POTENTIAL TO PRODUCE DAMAGING WIND GUSTS...LARGE HAIL AND A FEW TORNADOES.

THERE IS A SLIGHT RISK OF SEVERE THUNDERSTORMS FOR ALL OF THE OUTLOOK AREA PRIMARILY LATE TONIGHT. A COLD FRONT WILL CROSS THE AREA LATE TONIGHT. ANY THUNDERSTORMS ALONG AND AHEAD OF THE COLD FRONT WILL BE CAPABLE OF PRODUCING DAMAGING WINDS AND LARGE HAIL.

A SMALL CRAFT ADVISORY IS IN EFFECT THROUGH TONIGHT FOR THE MARYLAND CHESAPEAKE BAY AND THE TIDAL POTOMAC RIVER.

TIDAL DEPARTURES WILL INCREASE TODAY AS SOUTHERLY FLOW STRENGTHENS TODAY. WATER LEVELS MAY APPROACH THRESHOLDS FOR MINOR COASTAL FLOODING LATE TONIGHT FOR LOW-LYING AREAS ALONG THE TIDAL POTOMAC RIVER AND THE WESTERN SHORE OF THE MARYLAND CHESAPEAKE BAY.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

MINOR COASTAL FLOODING IS POSSIBLE THURSDAY ALONG THE TIDAL POTOMAC RIVER AND THE WESTERN SHORE OF THE MARYLAND CHESAPEAKE BAY.

THERE IS A SLIGHT RISK OF SEVERE THUNDERSTORMS ON THURSDAY ACROSS THE OUTLOOK AREA. THUNDERSTORMS ARE EXPECTED TO DEVELOP ALONG AND AHEAD OF A COLD FRONT THAT WILL CROSS THE REGION. SOME STORMS MAY BE SEVERE AND WILL BE CAPABLE OF PRODUCING DAMAGING WIND GUSTS AND LARGE HAIL. STORMS ALSO MAY PRODUCE VERY HEAVY RAINFALL THAT COULD LEAD TO LOCALIZED FLASH FLOODING.

A GALE WARNING IS IN EFFECT THURSDAY FOR THE MARYLAND CHESAPEAKE BAY FROM DRUM POINT TO SMITH POINT...AND FOR THE TIDAL POTOMAC RIVER FROM COBB ISLAND TO SMITH POINT. A SMALL CRAFT ADVISORY IS IN EFFECT FOR THE REMAINDER OF THE MARYLAND CHESAPEAKE BAY AND TIDAL POTOMAC RIVER.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION WILL BE NEEDED THIS AFTERNOON AND LIKELY WILL BE NEEDED LATE TONIGHT AND THURSDAY.

Short Term Hazards

Long Term Hazards

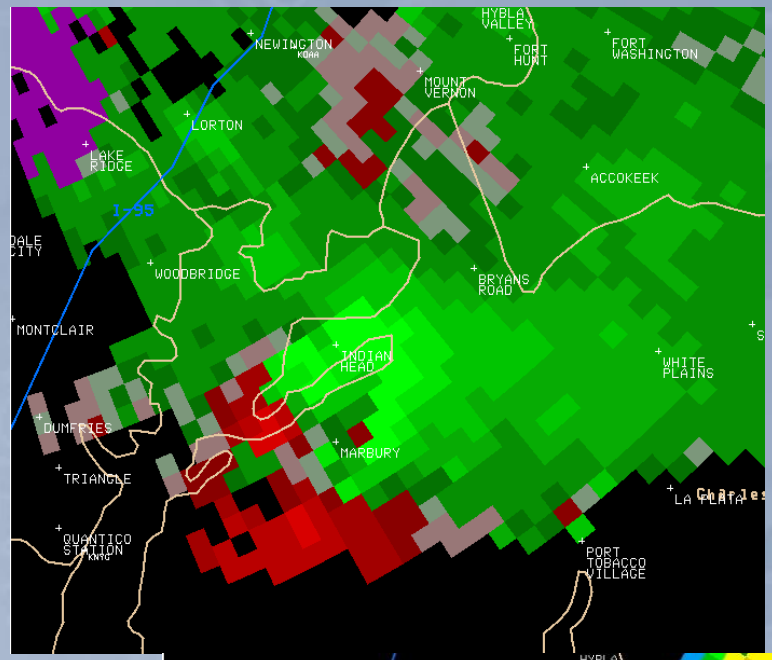
Spotter Activation

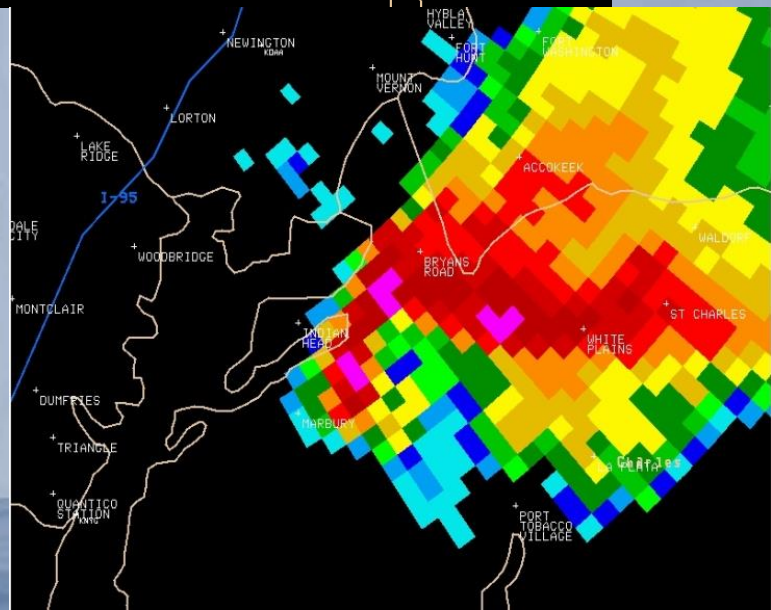
weather.gov/washington or weather.gov/baltimore

National Weather Service
Baltimore MD/Washington DC

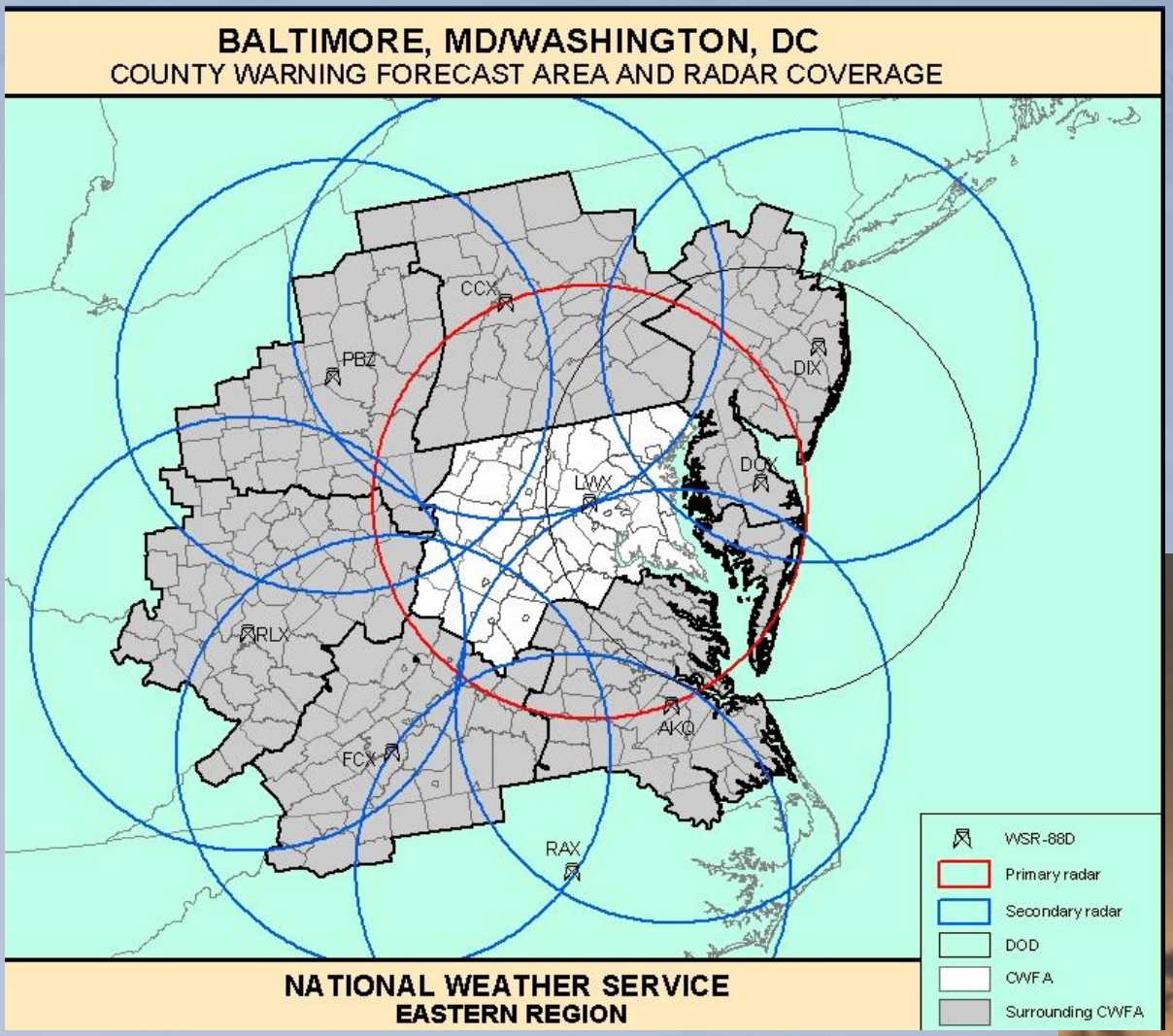
Convective Weather Topics

- Radar Basics
- Thunderstorm Ingredients
- Thunderstorm Life Cycle
- Types of Thunderstorms

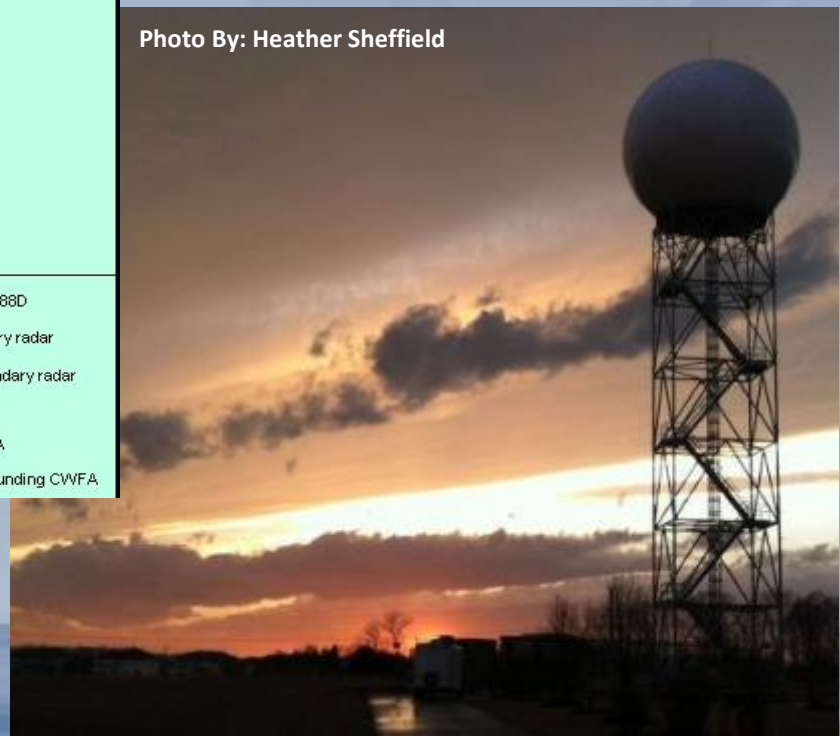




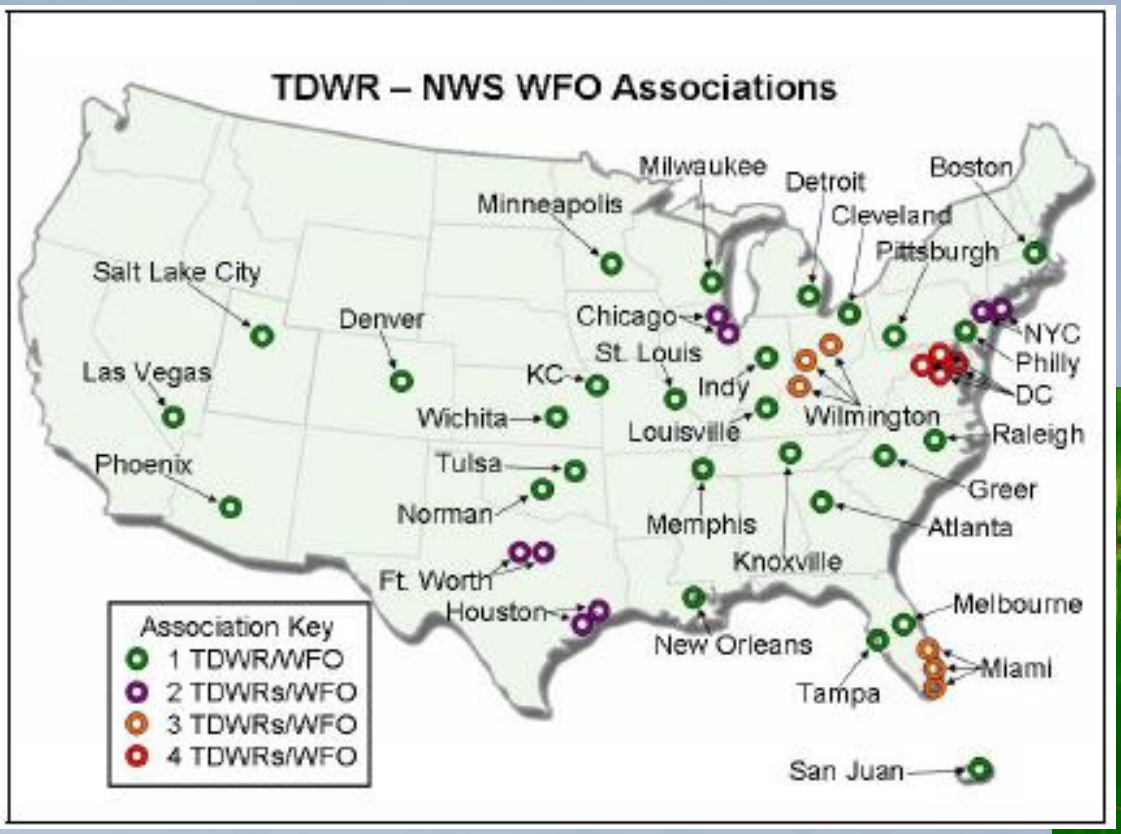
WSR-88D Coverage



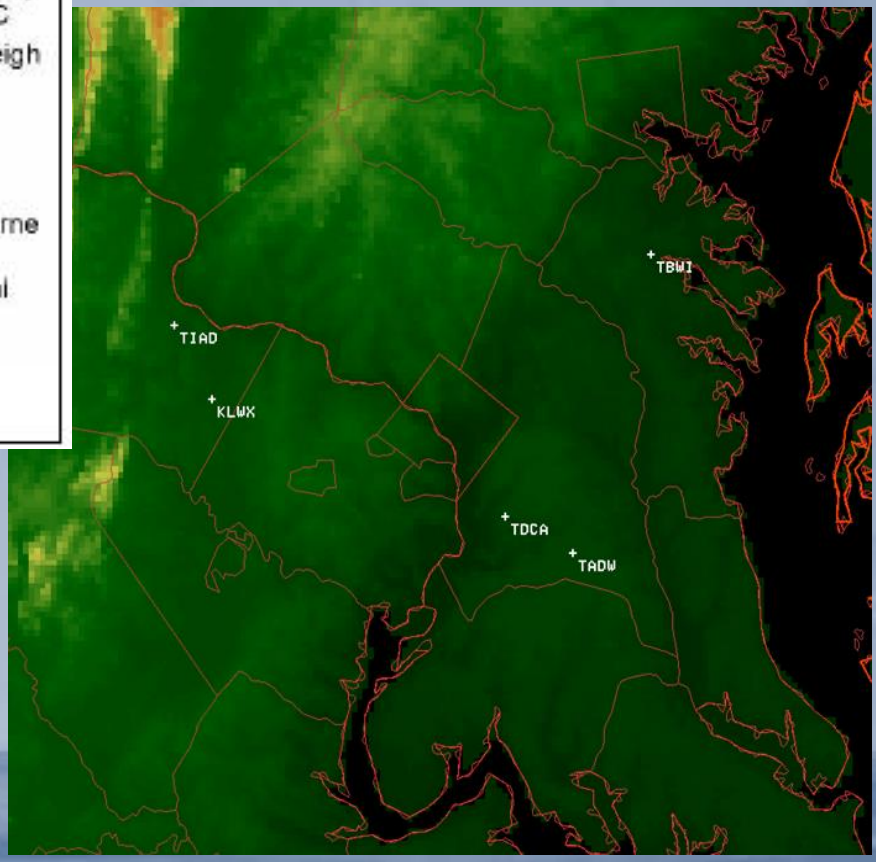
Radars are spaced so that there is good overlapping coverage in the Eastern U.S.



Terminal Doppler Radar (TDWR)



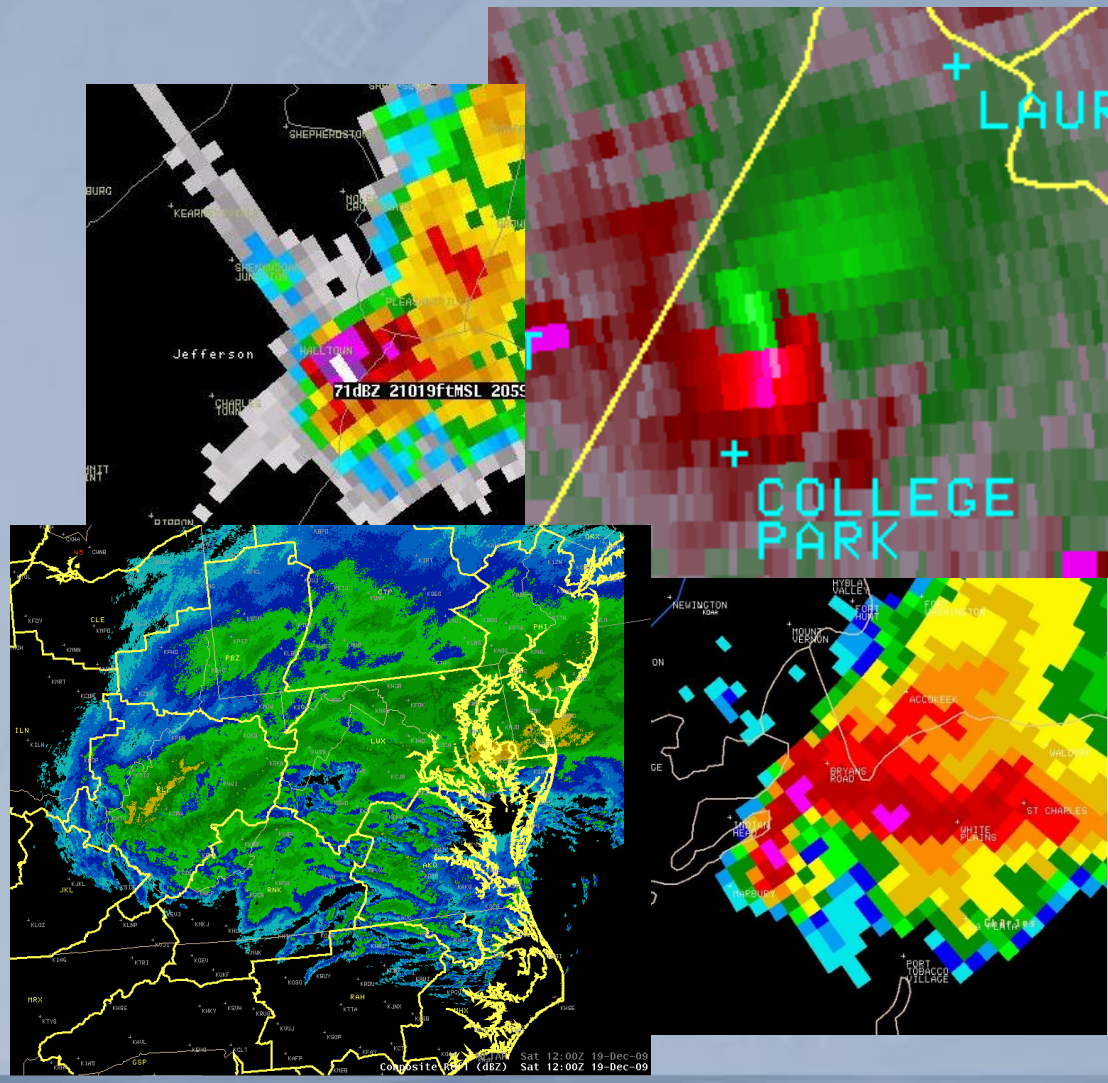
Terminal Doppler Weather Radars (TDWR) are a network of 45 FAA Doppler Radars deployed near major airports.



We have 4 TDWRs in our Forecast Area, located near IAD, DCA, BWI and Andrews Air Force Base.

What Can the Radar See?

- Rain
- Hail
- Winds
- Developing Tornadoes
- Snow
- Sleet



Thunderstorm Ingredients

Moisture

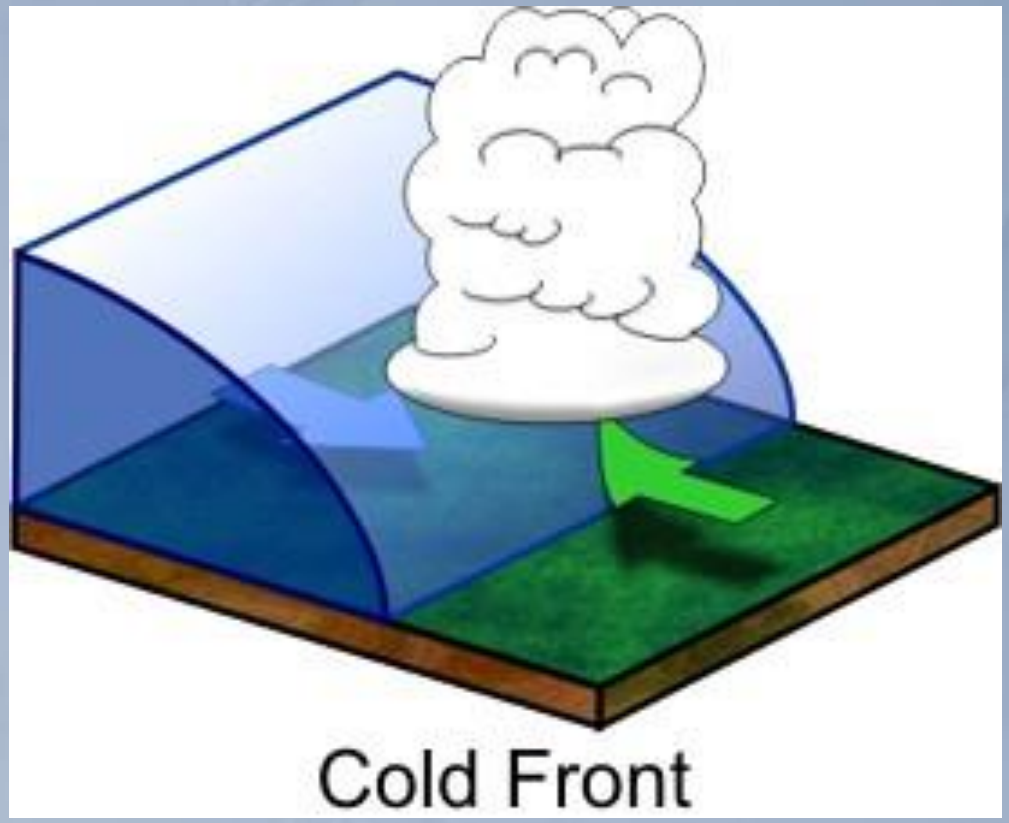
Our moisture sources are the Atlantic Ocean, Gulf of Mexico and the Chesapeake Bay.

Thunderstorm Ingredients

Lift

For lift, you need a mechanism or boundary for convergence. Cold fronts are a good source of lift.

When air is forced upward along a front, it cools/condenses and precipitation forms.



Convergence of wind along the cold front.

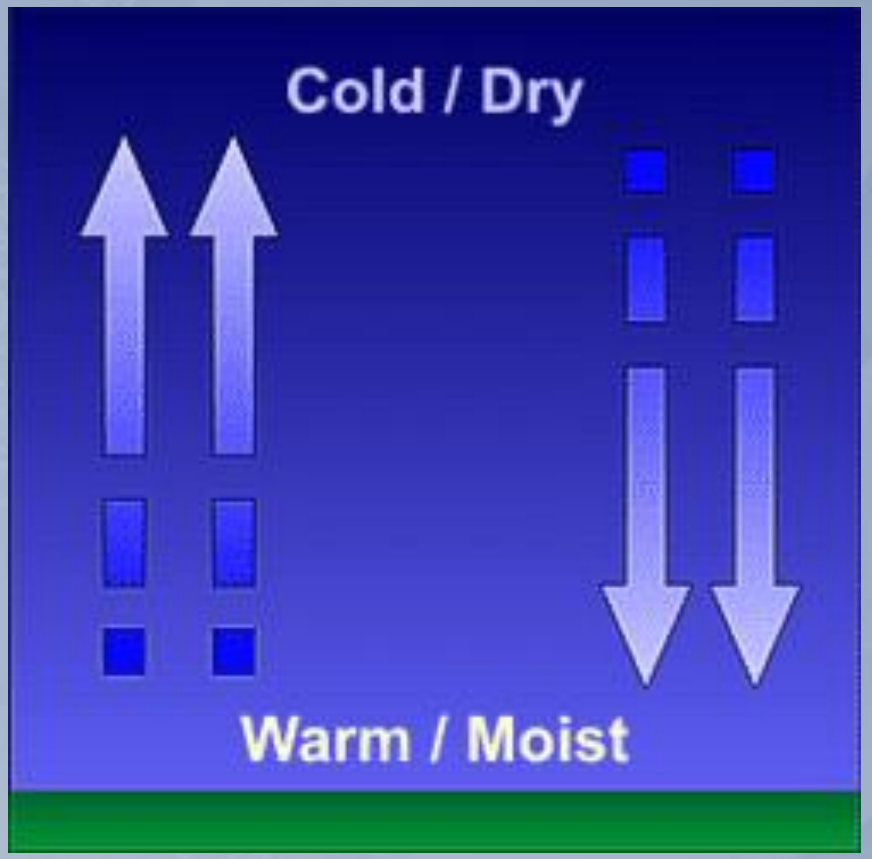
Thunderstorm Ingredients

Instability

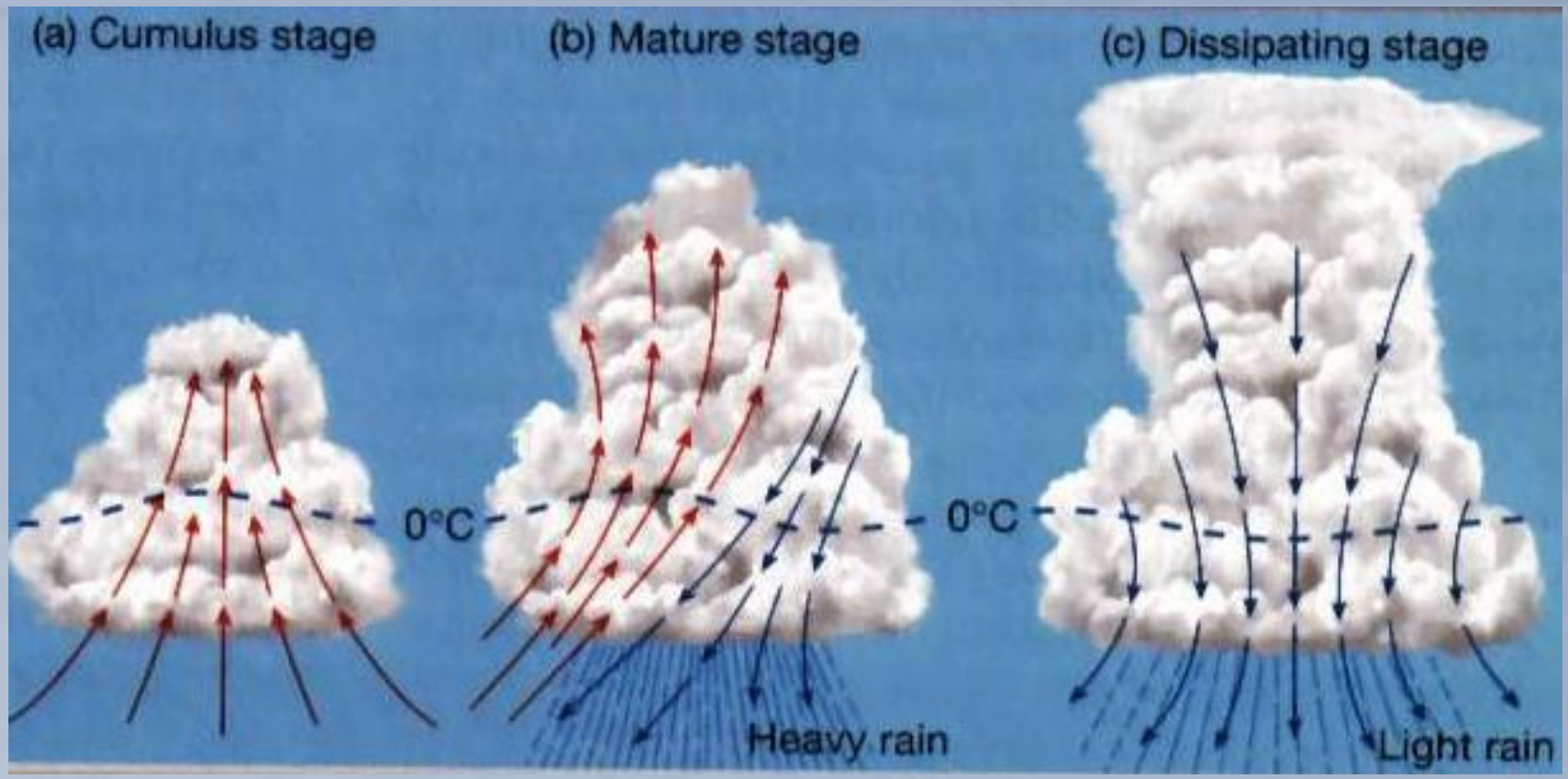
An airmass is considered unstable if a parcel of air continues to rise when given a nudge upward (like a cold front).

In an unstable airmass, warm moist air is near the surface while cold dry air is aloft.

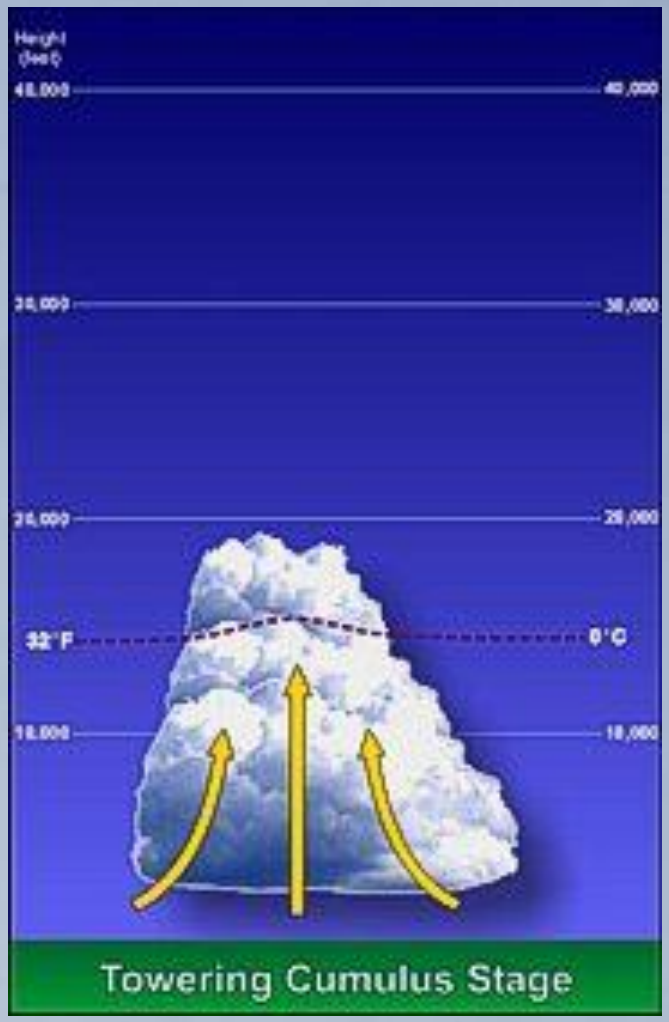
The more warm & moist the airmass is at the surface and the colder & drier the airmass is aloft…the more unstable the atmosphere is.



The Thunderstorm Life Cycle



Updraft **Updraft & Downdraft** **Downdraft**

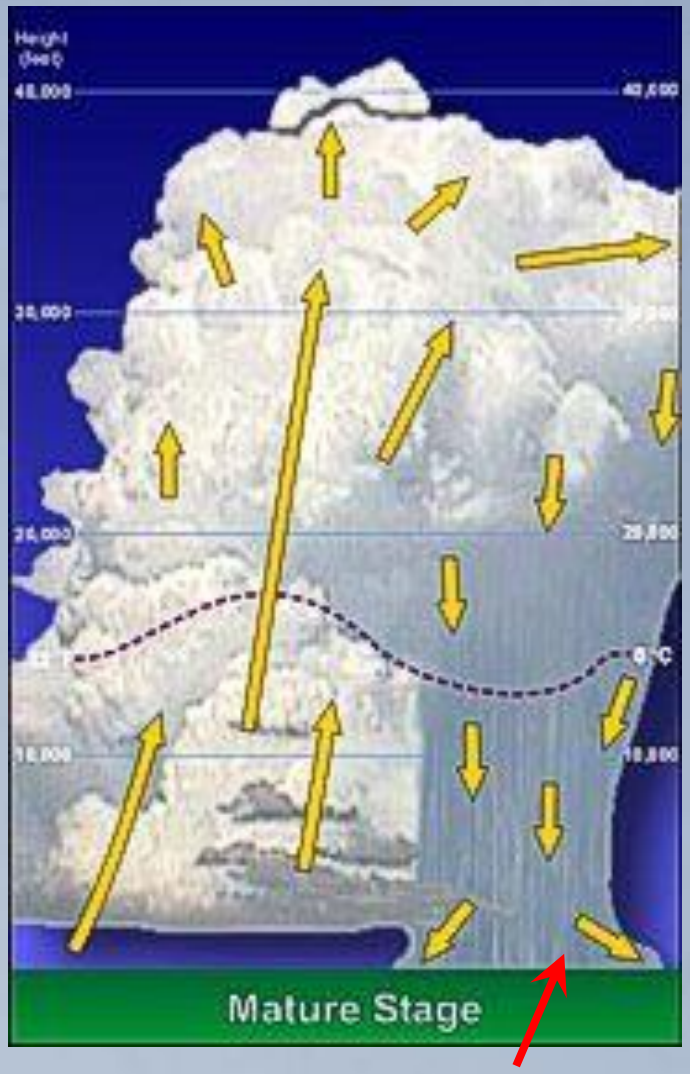


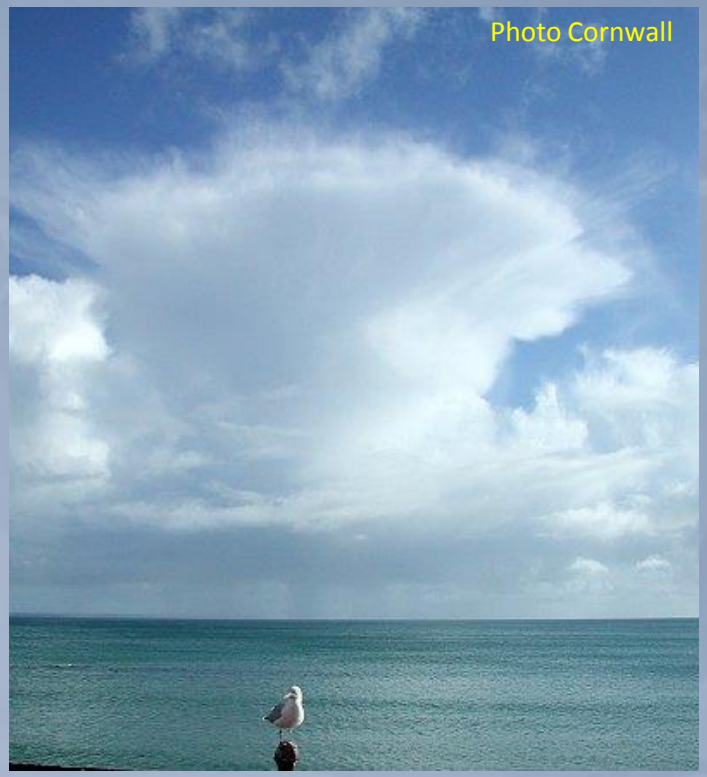
Updraft Dominant

Warm air is rising, cooling and condensing to form clouds.

Photo MIT

Cumulus Stage: Building Clouds

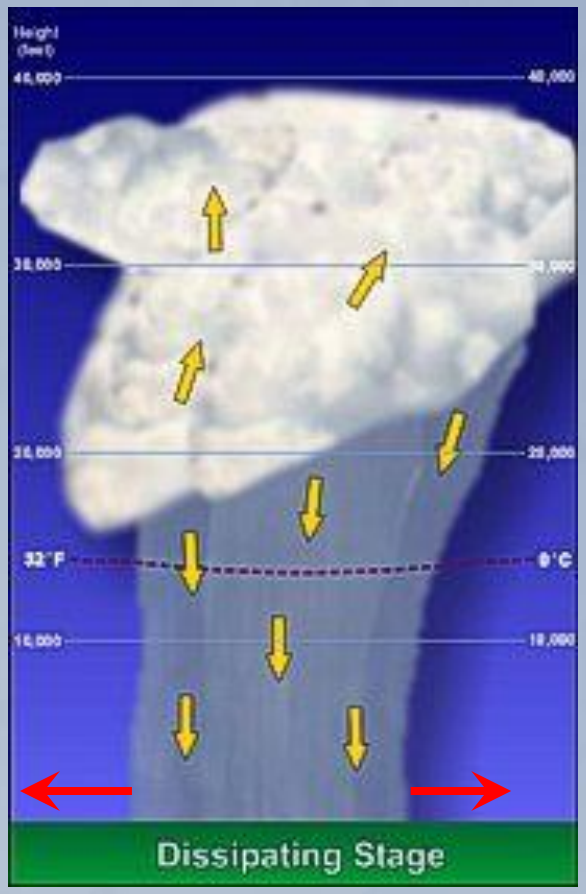




Mature Stage: Developed Thunderstorm

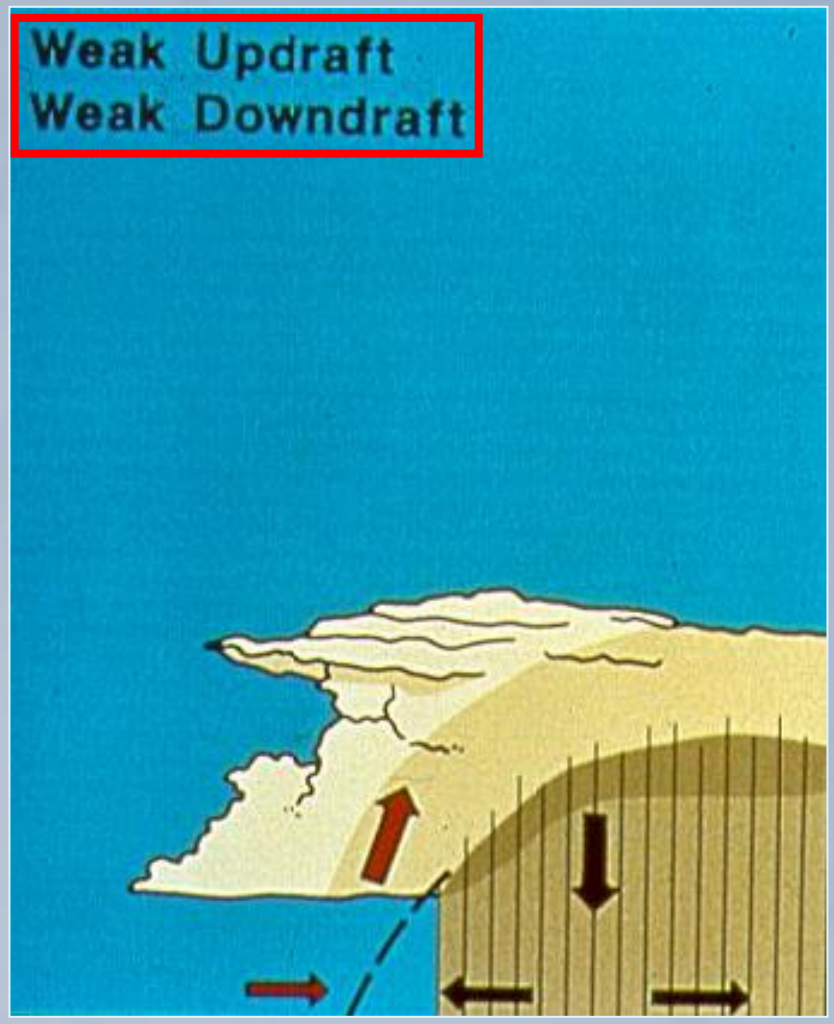
When the rain-cooled air impacts the surface and spreads out it creates a gust front. Sometimes winds can be very strong along the gust front.

Dissipating Stage: Weakening Thunderstorm

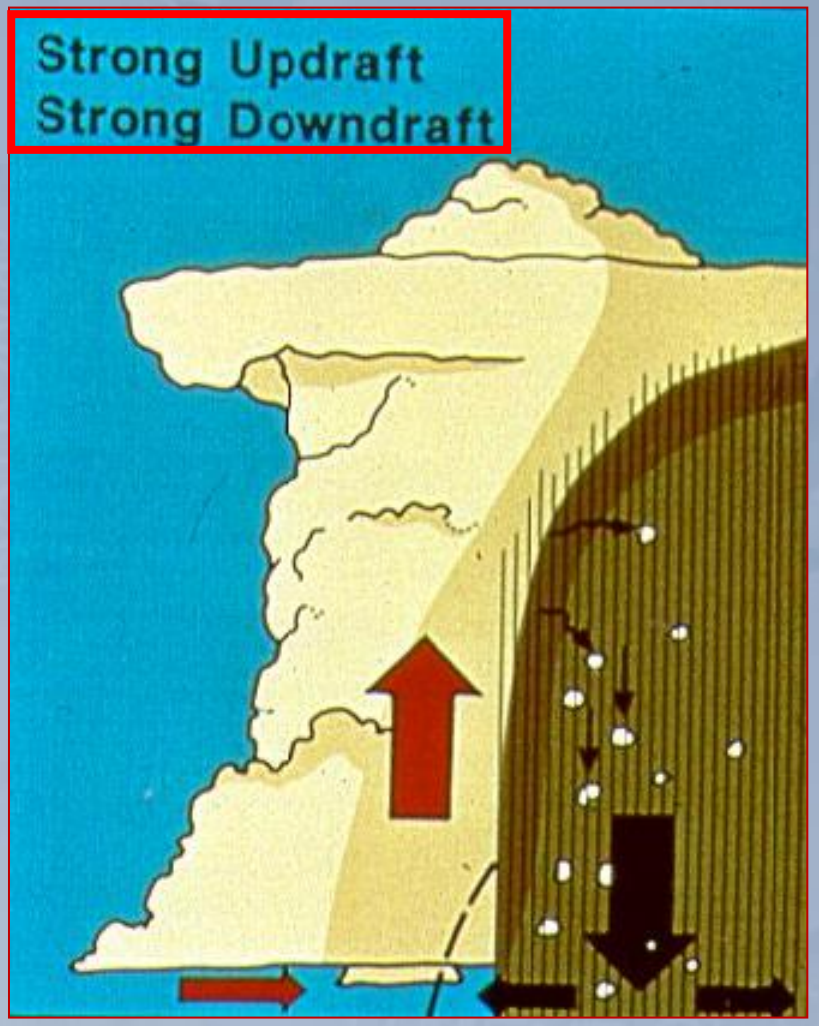


As the gust front moves away from the base of the storm, it cuts off the storms inflow and it begins to dissipate. The gust front may trigger new storms by convergence if the environment is moist and unstable.

What is the Difference Between an Ordinary Thunderstorm and a Severe Thunderstorm?



Ordinary Thunderstorm



Severe Thunderstorm

Types of Thunderstorms

Single Cell

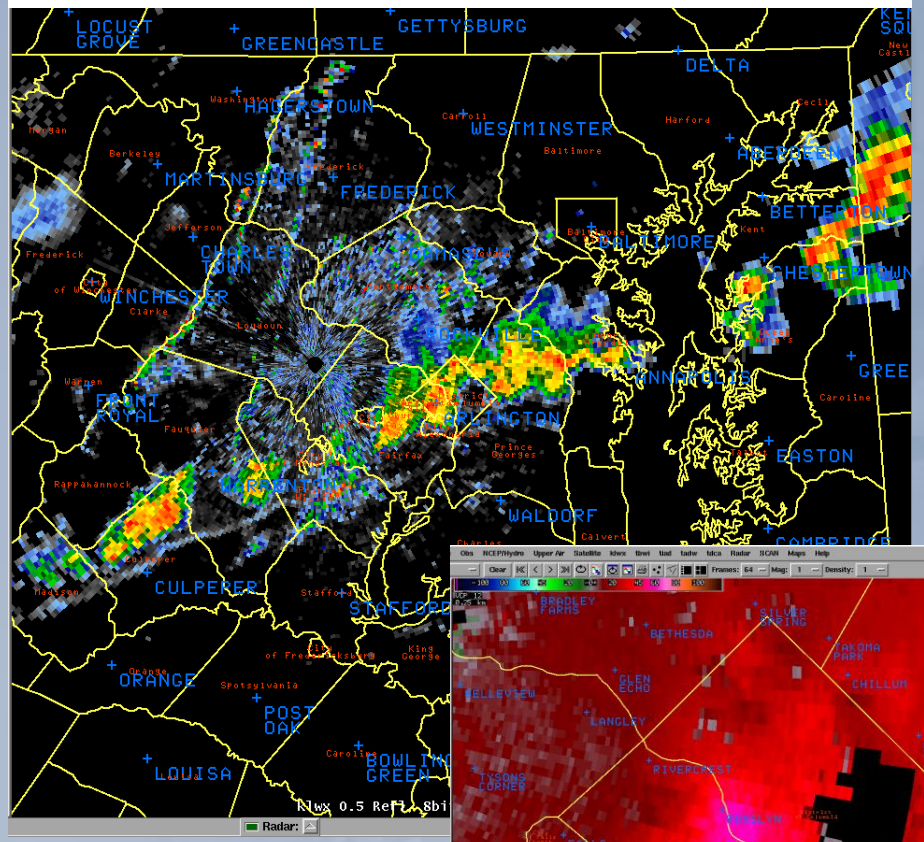
- Generally Weak
- Short Lived
- Poorly Organized
- "Pulse Storms"
- Usually "Rainers"

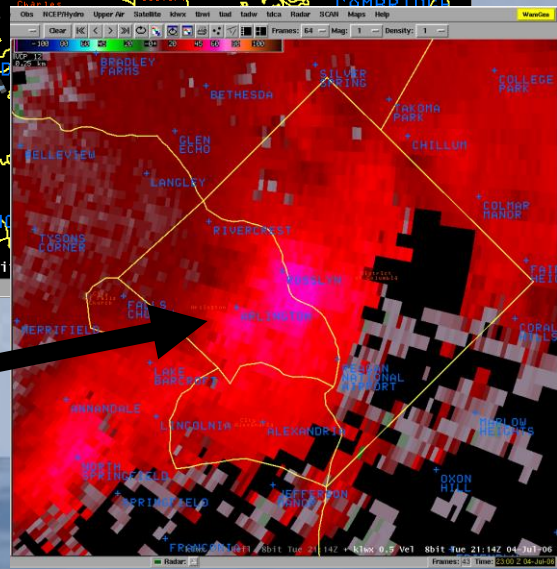
Types of Thunderstorms

Multicellular Cluster

- Most Common
- Long Lived
- Series of thunderstorms that move as one unit
- Has the potential to produce severe weather

July 4, 2006



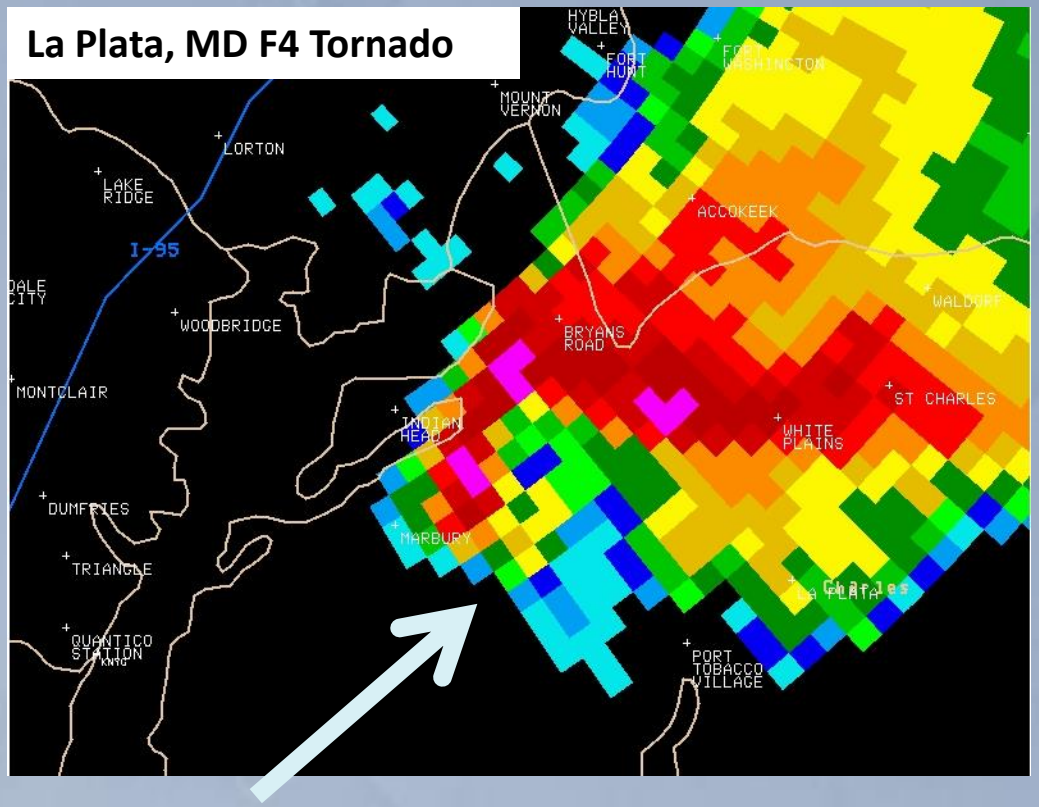


Winds over 60 MPH off the Base Velocity Product

Types of Thunderstorms

Supercells

- Rare
- Long Lived
- Very strong with single updraft
- Has a strong mesocyclone
- Severe weather producer



Hook Echo: Indicative of a Mesocyclone and may lead to tornadogenesis.

Mesocyclone: rotation within the storm

Supercells Can Produce Tornadoes

For tornadogenesis: You need strong vertical wind shear

Vertical Wind Shear: A change of wind speed and direction with height

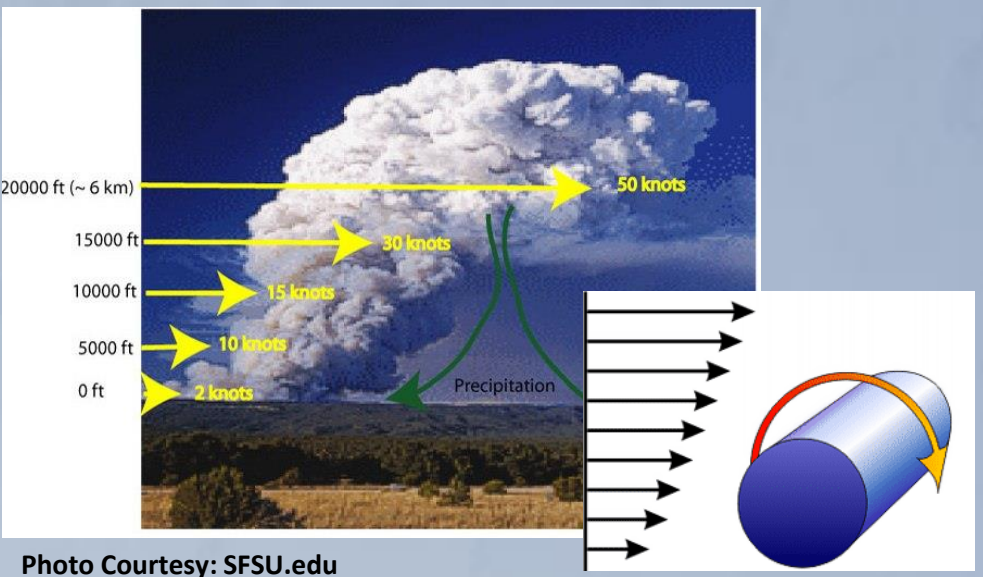
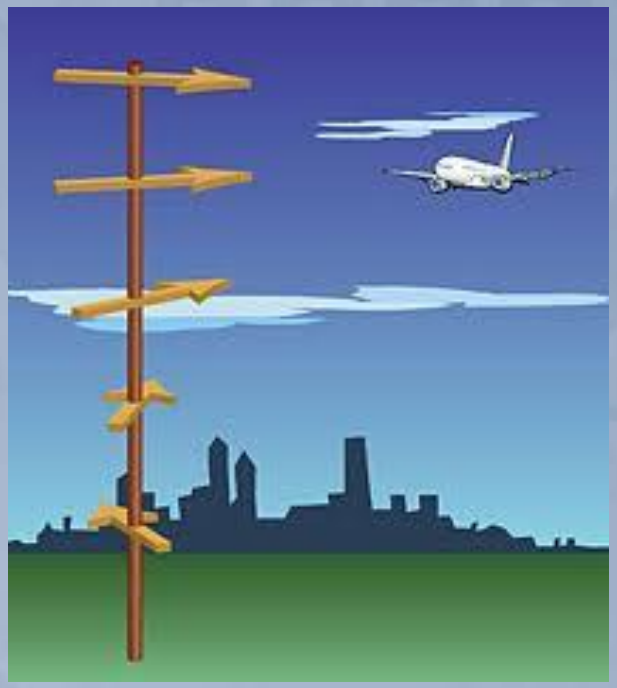


Photo Courtesy: SFSU.edu

Stronger Wind Speeds Aloft



Change of Wind Direction With Height

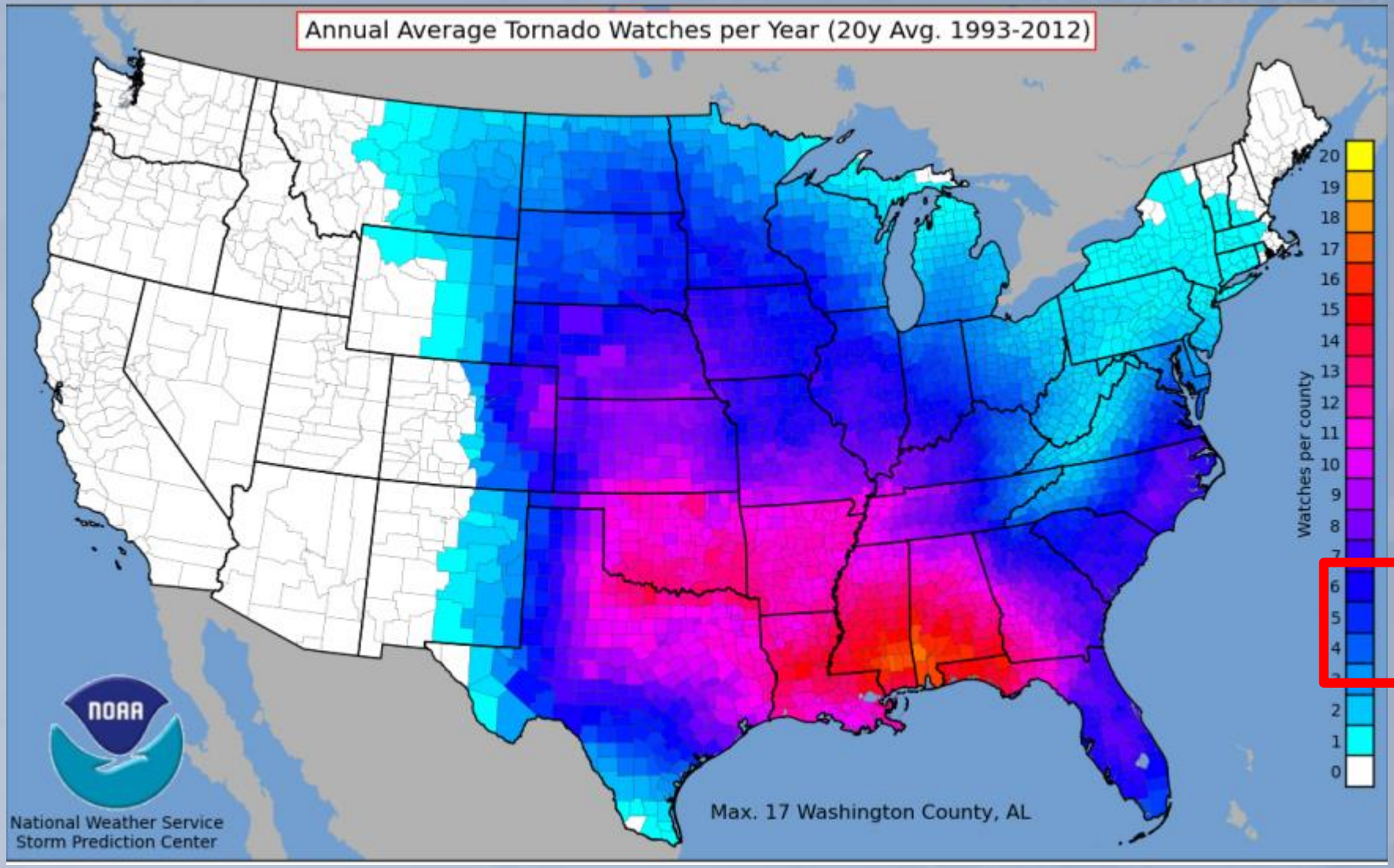
Vertical wind shear creates a "spin" in the atmosphere.

Break Time

National Weather Service
Baltimore MD/Washington DC

Dangerous Weather in the Mid Atlantic

- Convective
  - Severe Thunderstorms (Hail & Damaging Winds)
  - Tornadoes & Waterspouts
- Flood/Flash Flood
- Tidal Flooding
- Winter Weather
- Tropical Weather
- Fire Weather


Annual Average Tornado Watches per Year (20y Avg. 1993-2012)
Watches per county
20
19
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17
16
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9
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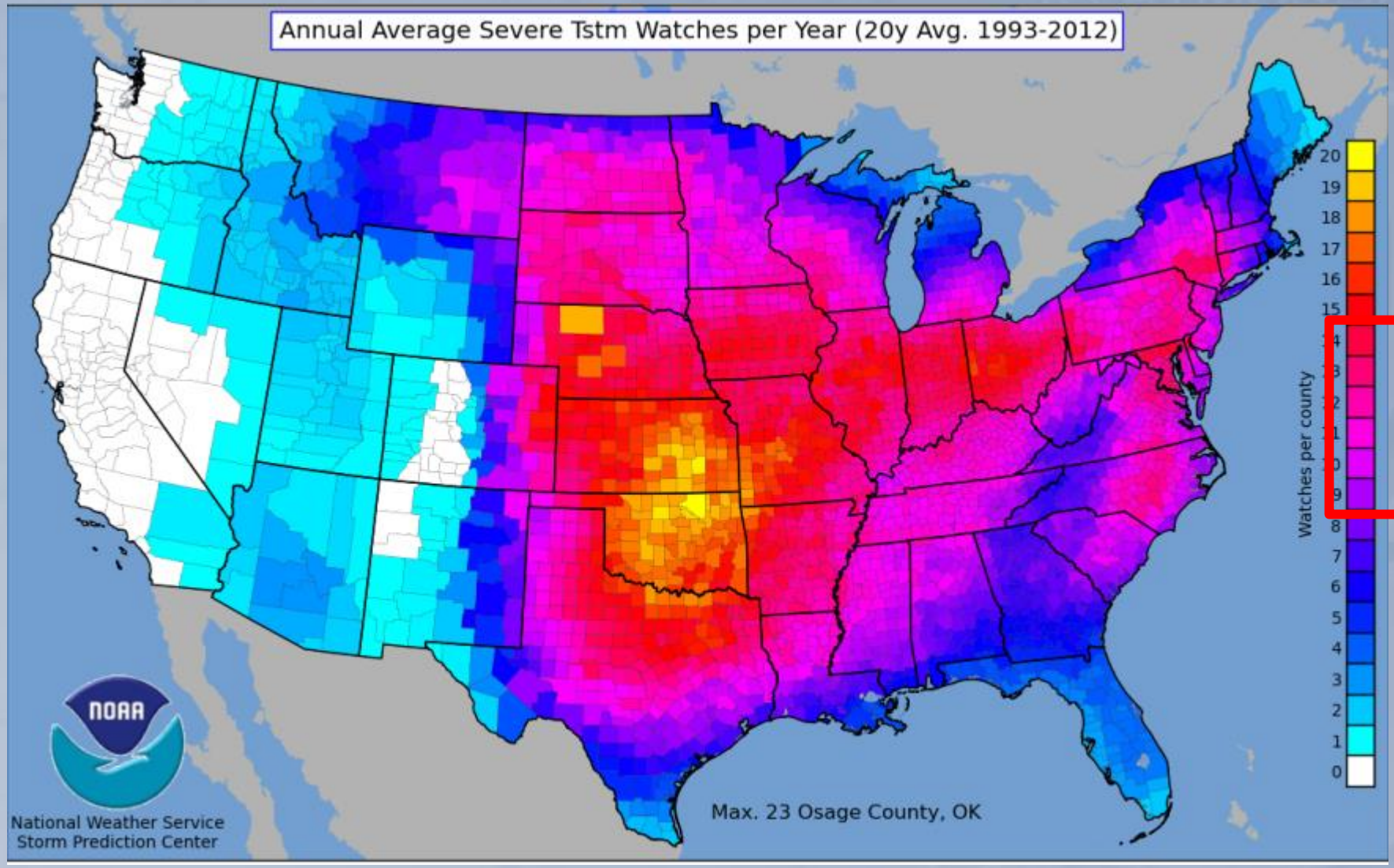
1
0
Max. 17 Washington County, AL
NOAA
National Weather Service
Storm Prediction Center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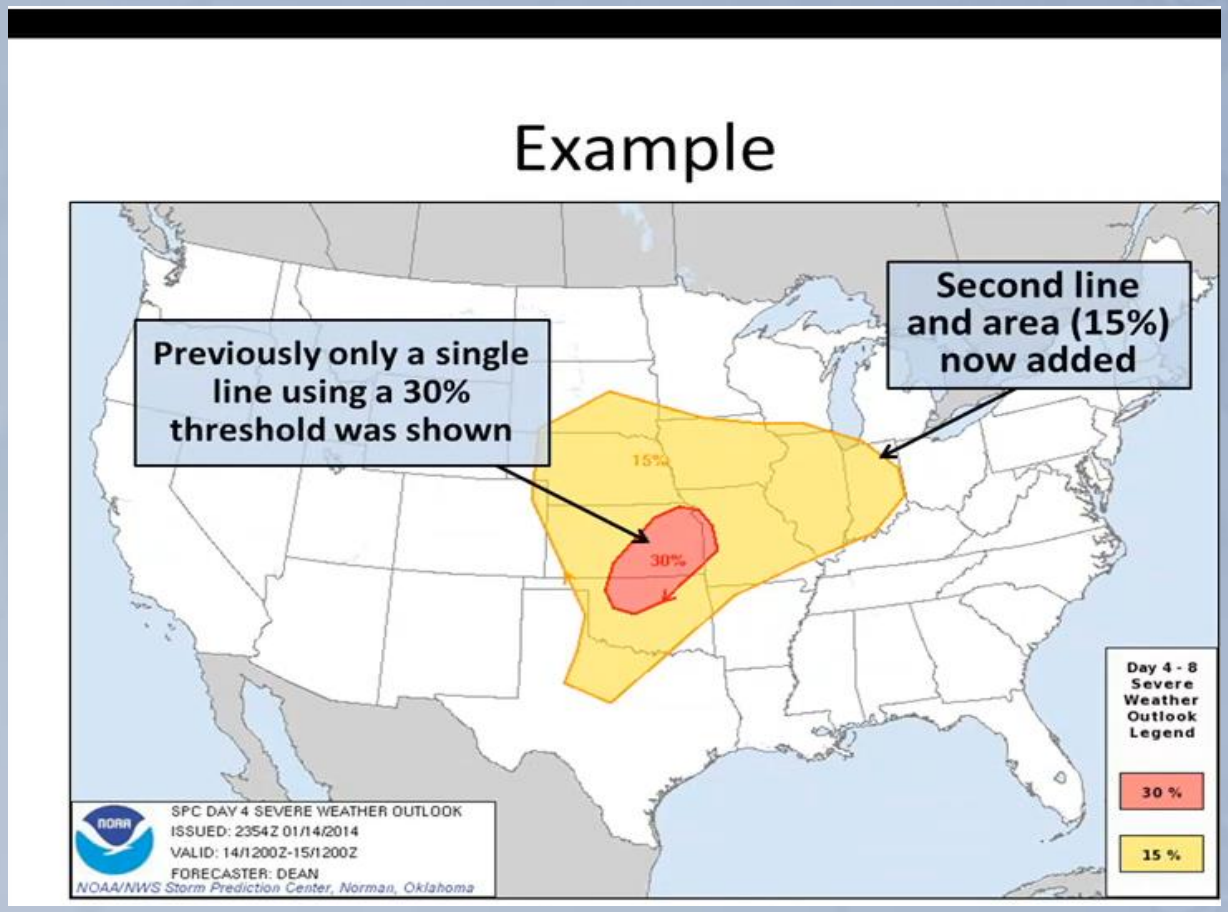
5
4
3
2
1
0
NOAA
National Weather Service
Storm Prediction Center
Max. 23 Osage County, OK

Storm Prediction Center Outlooks
2014 Changes



The Day 4-8 Severe Weather Outlook denotes general areas where severe weather may occur.

The addition of the 15% line started in Dec 2014.

Storm Prediction Center Outlooks
2014 Changes

Have split the previous Slight Risk category into two new: Slight & Enhanced

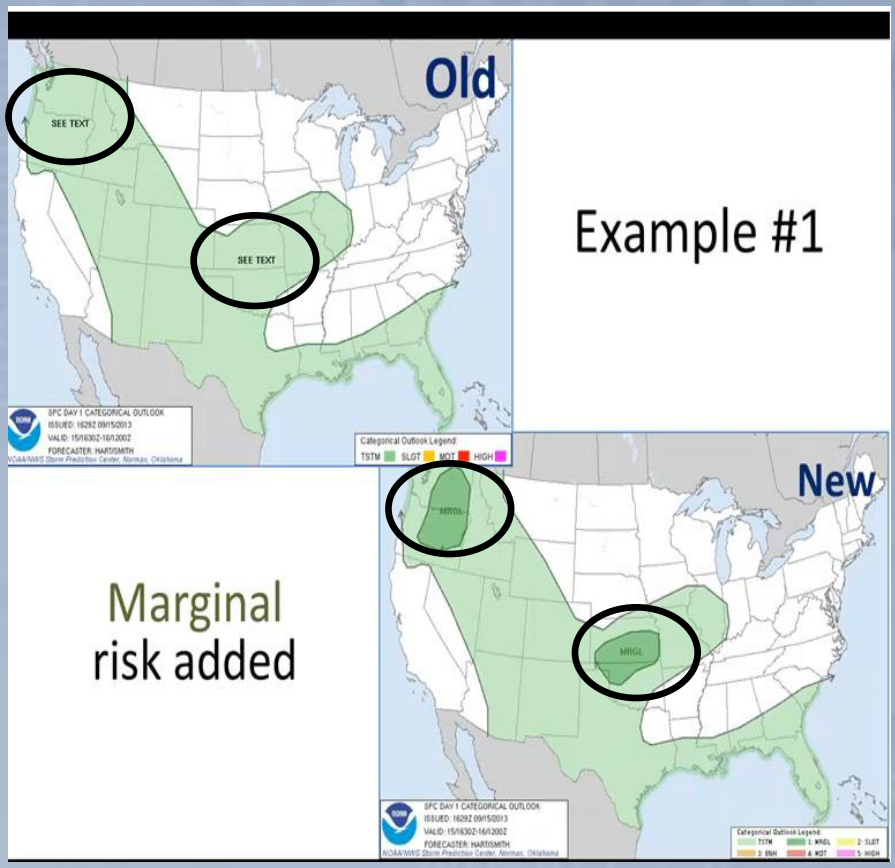
Day 1, Day 2, Day 3 Categorical Outlook Changes
effective October 22, 2014

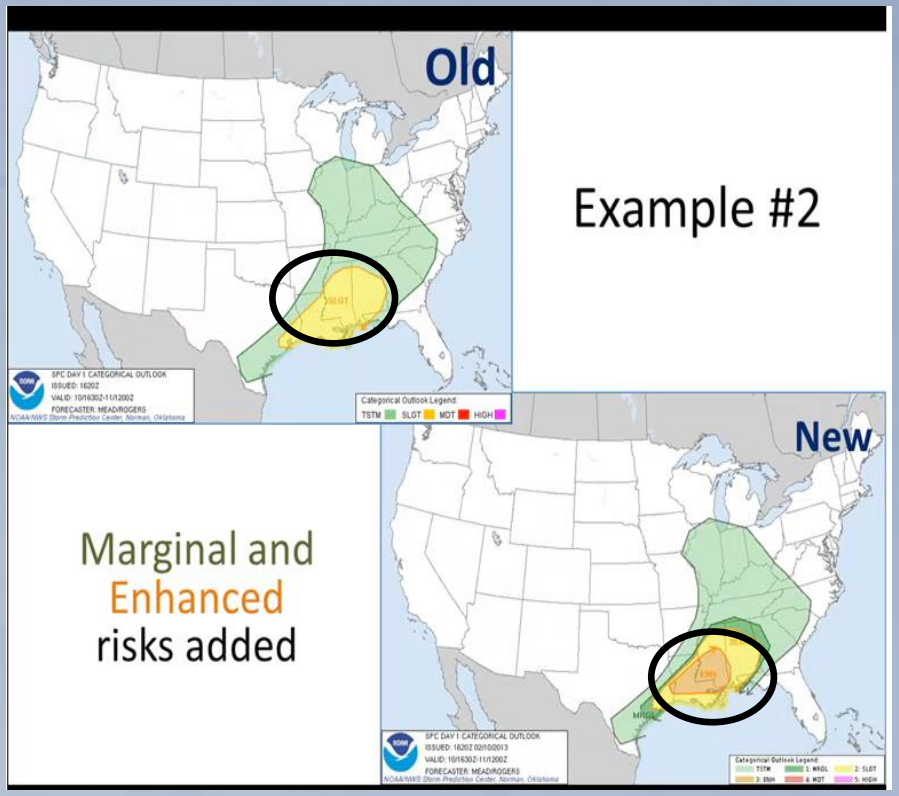
*Increase risk categories to **5 levels** for Day 1 and Day 2 Outlooks*
*Increase risk categories to **4 levels for** Day 3 Outlook (High not forecast)*

"See Text"	→	Marginal Line/area added to Categorical Outlook
Slight	→	Slight
	→	Enhanced (Slight)
Moderate	→	Moderate Essentially unchanged but SIG severe required
High	→	High

****General thunder will still be noted****

Examples



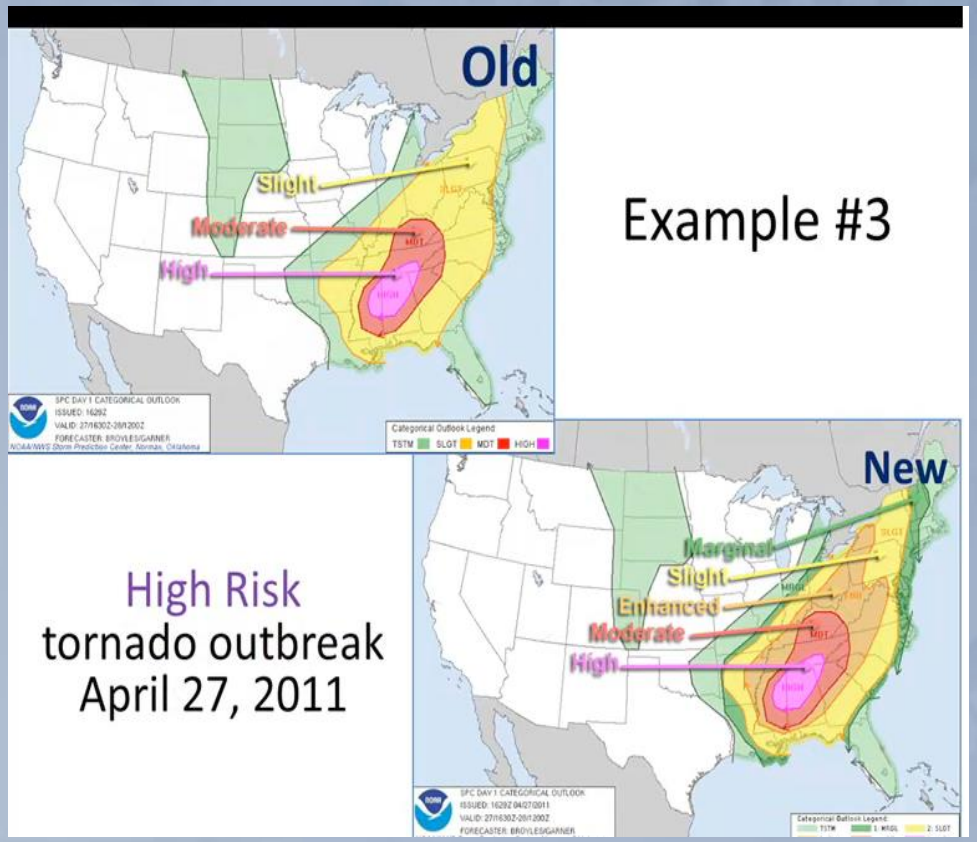


Example #2

Marginal and Enhanced risks added

Categorical Outlook Legend:

TSTM	1: MRGL	2: SLGT
3: ENH	4: MDT	5: HIGH



Example #3

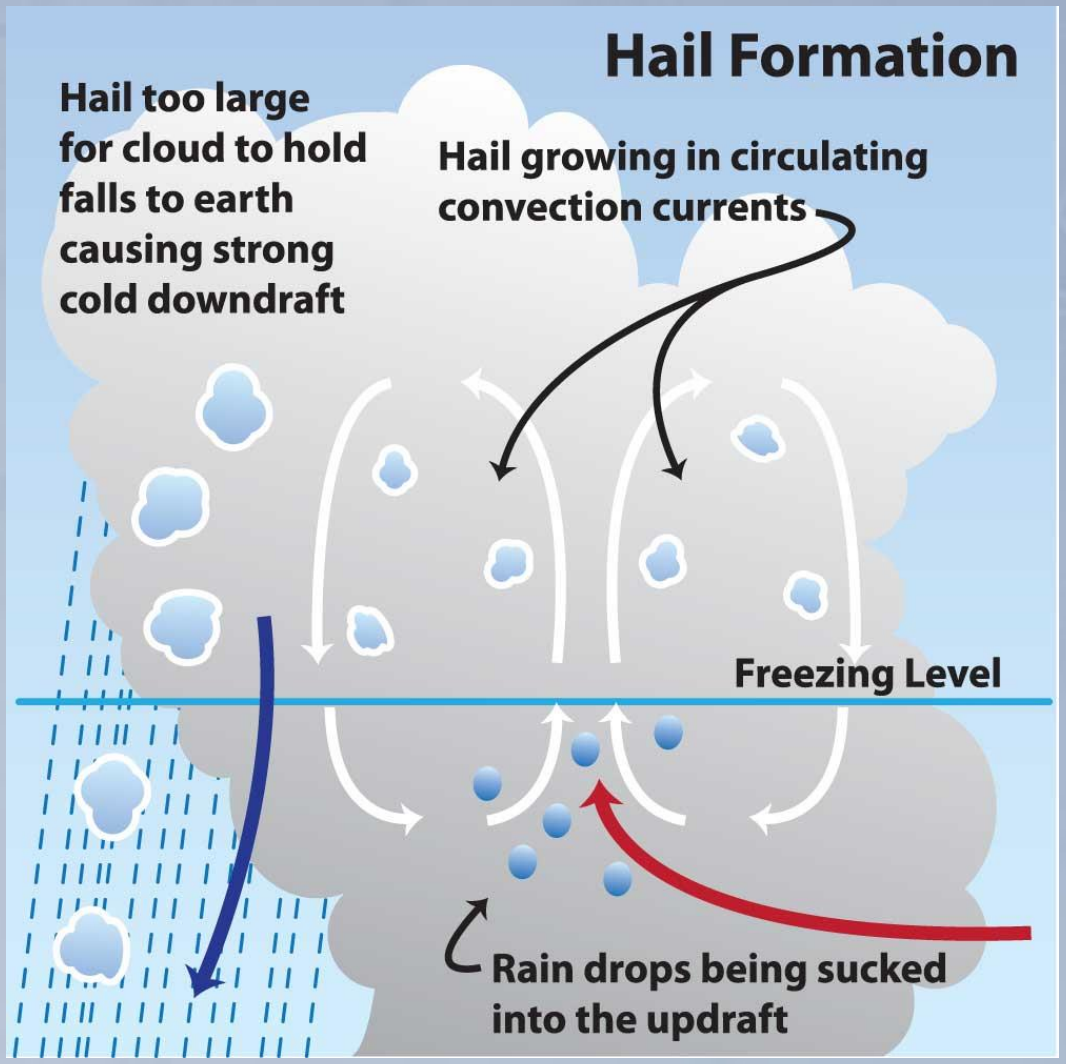
High Risk tornado outbreak April 27, 2011

Severe Thunderstorms

Warning Criteria: 1” Hail and/or 58 MPH Winds

- Damaging straight-line winds from an intense t-storm downdraft can cause extensive damage and loss of life
- Like a targeted “punch” of wind
- Often comes with heavy rain/hail
- Often confused with tornadoes especially at night

How Does Hail Form?



Hail forms by a process called aggregation.

Water droplets are picked up by the updraft and carried well above the

When the hail stone becomes too large for the updraft to support, the hail stone will fall out of the storm.

How to Report Hail

Hail reports are the most difficult to gather. The hail shaft can be very narrow and short lived.

“Marble Size” hail is ambiguous. Do not report hail as marble sized.

How to Report Hail

It is important to measure and report the largest hail stone found in the storm.

ed along the longest

o use a ruler or tape

ure.

More on Hail

- While quarter sized hail damages plants and agriculture, it takes about golf ball sized hail to start denting vehicles.
- Around our area, the largest hail reports get up to be softball sized, which can damage homes, shred trees of their leaves, and even be a mortal threat to children.

The largest hail stone on record was 8” in diameter and weighed 1lb 15oz. The hail stone fell out of a severe thunderstorm in Vivian, SD on July 23, 2010.

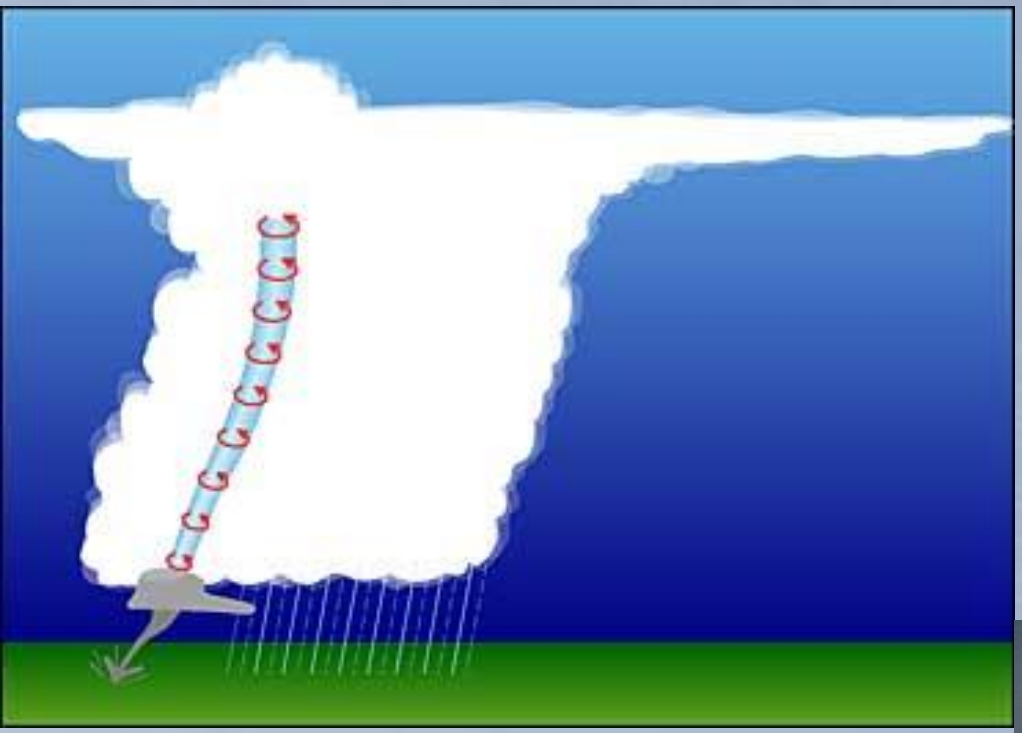
Tornadoes, Funnel Clouds & Waterspouts

Tornado: A violently rotating column of air attached to a cloud base and **in contact with the ground**

Waterspout: A tornado over the water.

Funnel Cloud: A rapidly rotating column of air **NOT in contact with the ground.** Some funnel clouds go on to become tornadoes, others do not.

Tornadogenesis



The “spin” created by vertical wind shear gets sucked into the updraft of the thunderstorm…leading to a mesocyclone.

If the rotation within the thunderstorm stretches to reach the ground…a tornado is formed.

Tornado Facts

Weak Tornado

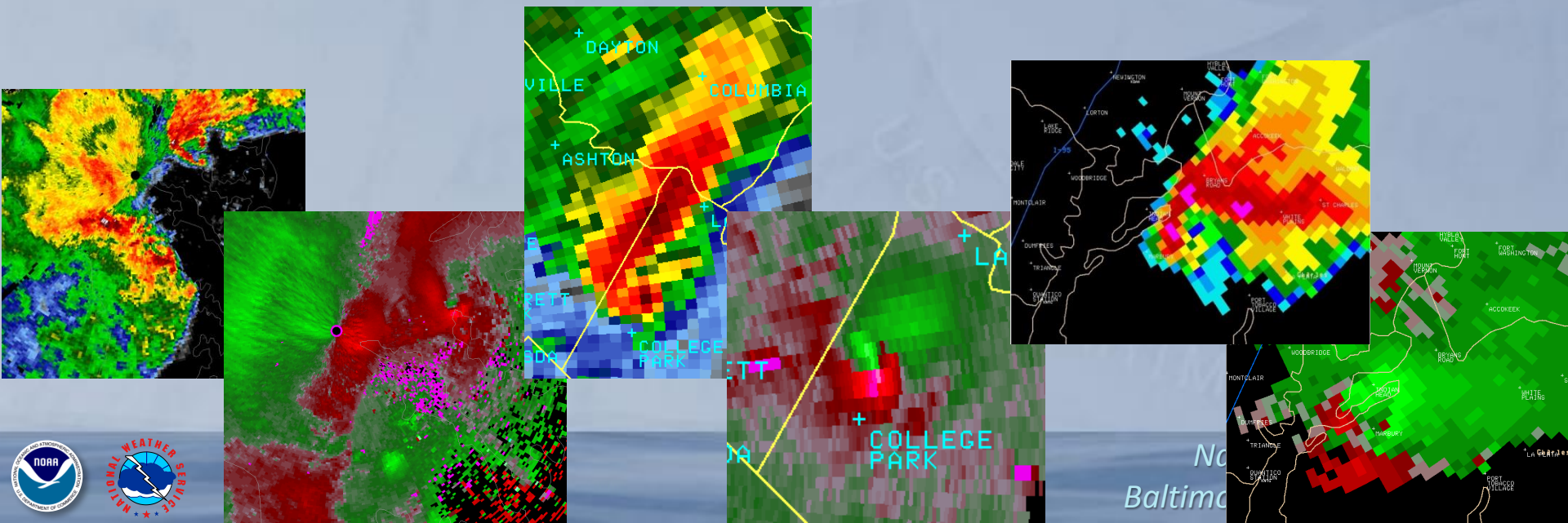
- Most frequent *(90%)*
- Brief
- EF0/EF1 Winds < 111 MPH
- Few Fatalities
- More difficult to detect

Strong Tornado

- Much less frequent
- Typically lasts longer
- EF2/EF3 Winds to 165 MPH
- Some Fatalities
- Easier to detect

Violent Tornado

- Rare
- Long lived
- EF4/EF5 Winds > 165 MPH
- Many Fatalities
- Nearly always detected

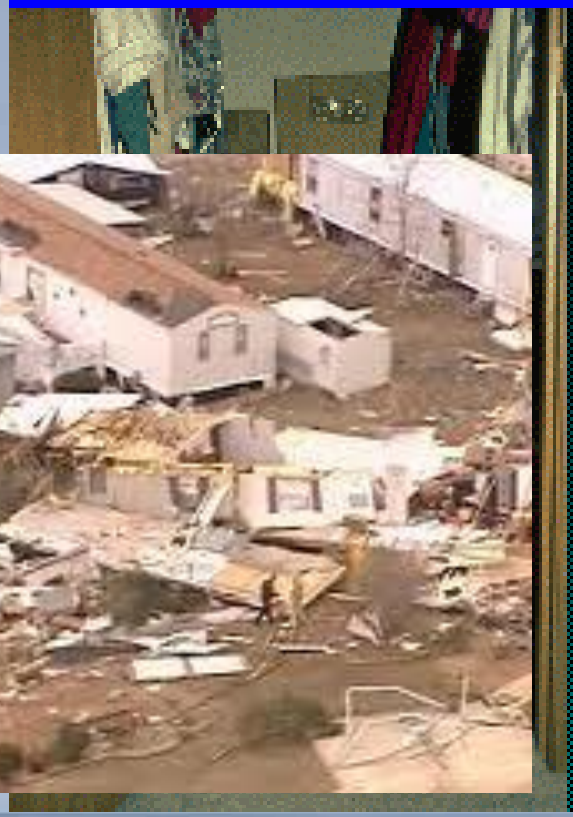


Tornado Safety

Seek sturdy shelter in an interior room if a tornado is approaching. Crouch down and cover your head.

If caught outside, seek sturdy shelter immediately!!!!

Mobile homes are NOT safe!!!!



- **Stay away from windows!!!**

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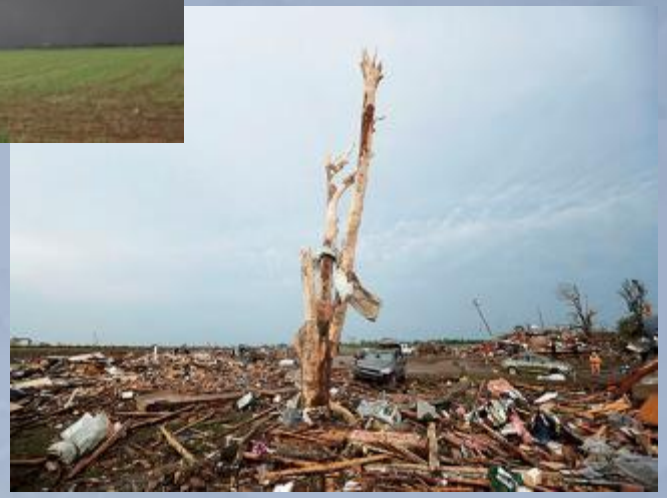
2013 Tornado Season

(All Numbers are Subject to Change)

- Total Number of Tornadoes: 943
- Greatest Number of Tornadoes in a Month: May - 267
- Fatalities: 55
- Injuries: 756
- Estimated Property & Crop Losses: $3.6 Billion USD
- Number of EF3 or Greater Tornadoes: 28
- Number of F5 Tornadoes: 1



EF-5 Newcastle-South OKC-Moore Tornado May 20, 2013

2013 Tornado Statistics

- 55 Fatalities Nationwide
- 10 year avg is 108
- 22% of the fatalities were in a mobile home
- 33% of the fatalities were in a permanent home
- 20% of the fatalities were persons aged 0-9

Unlike most years, the most dangerous place to be was in a permanent home.

Local Tornado Statistics & Climatology

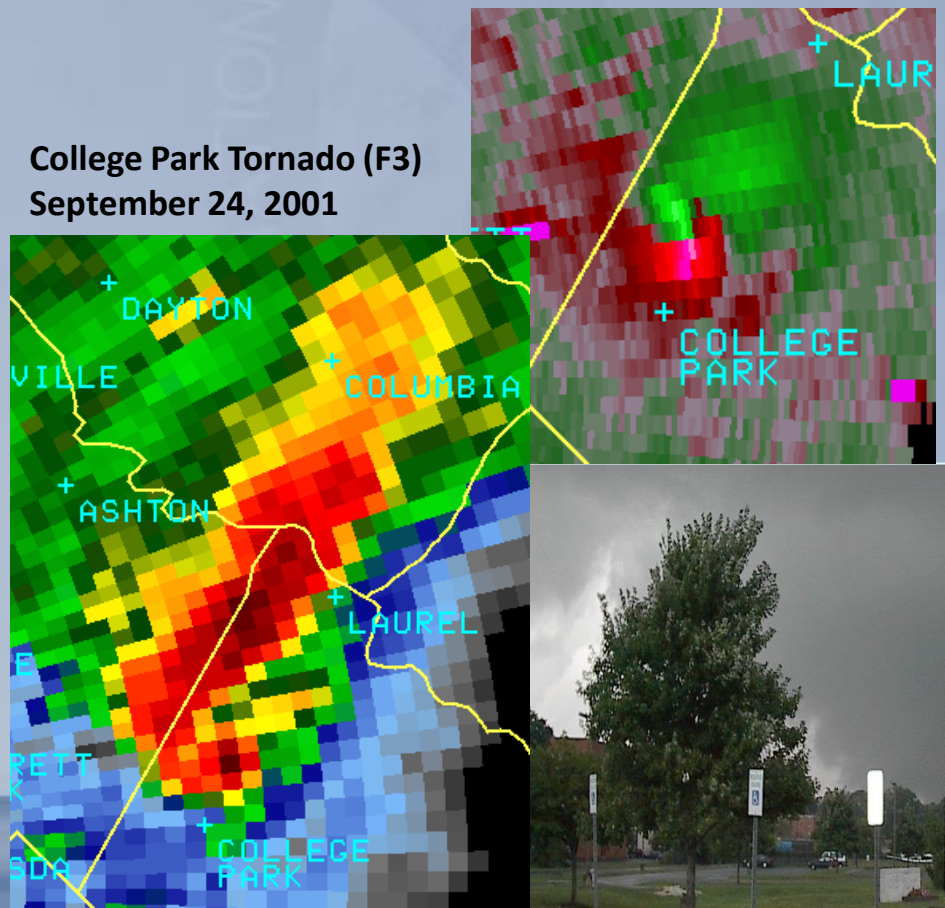
- Total of 21 deaths have occurred in our CWA due to tornadoes over the past 60 years.

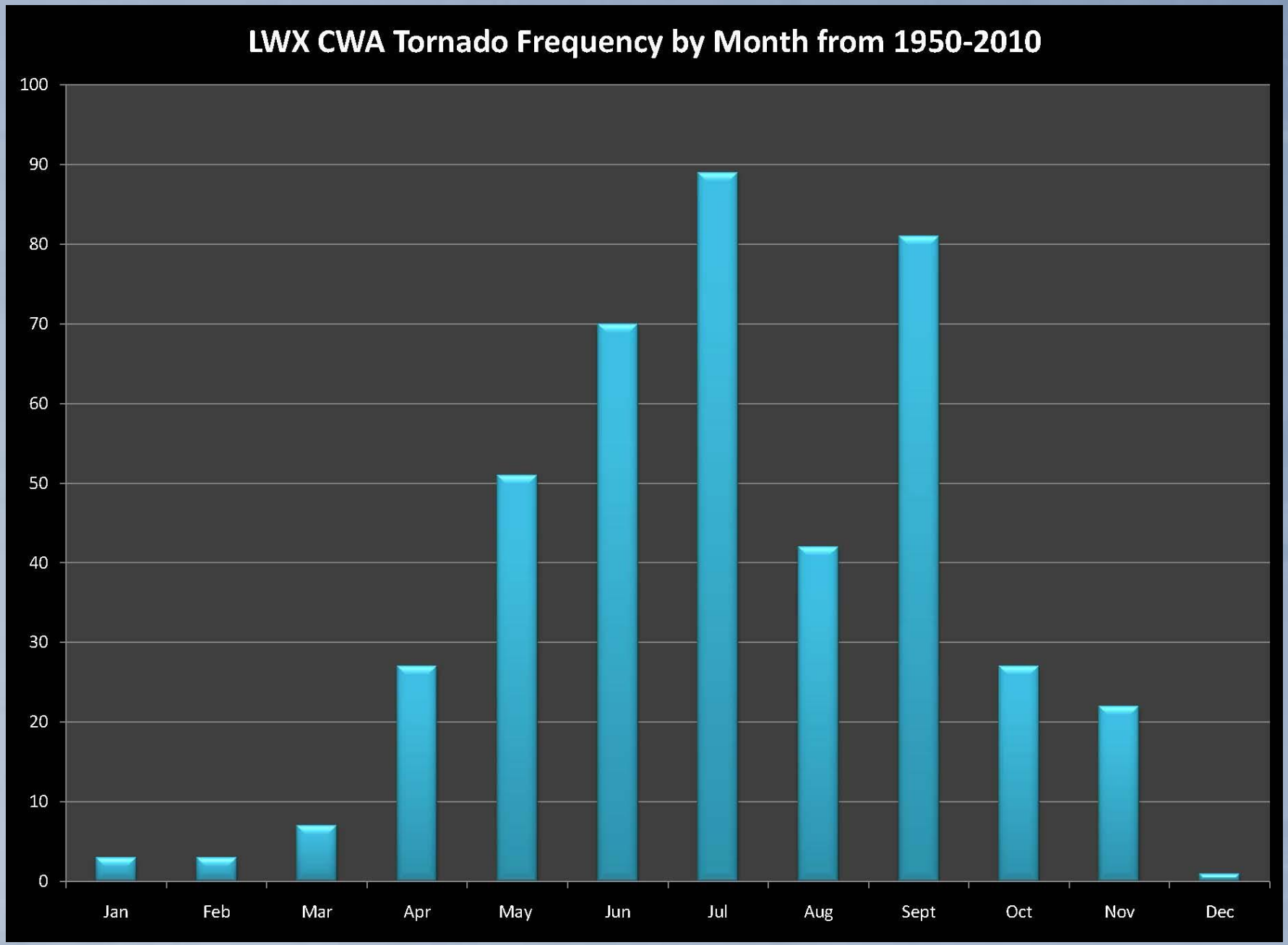
- A total of 411 tornado-related injuries have occurred within our CWA from 1950-2010.

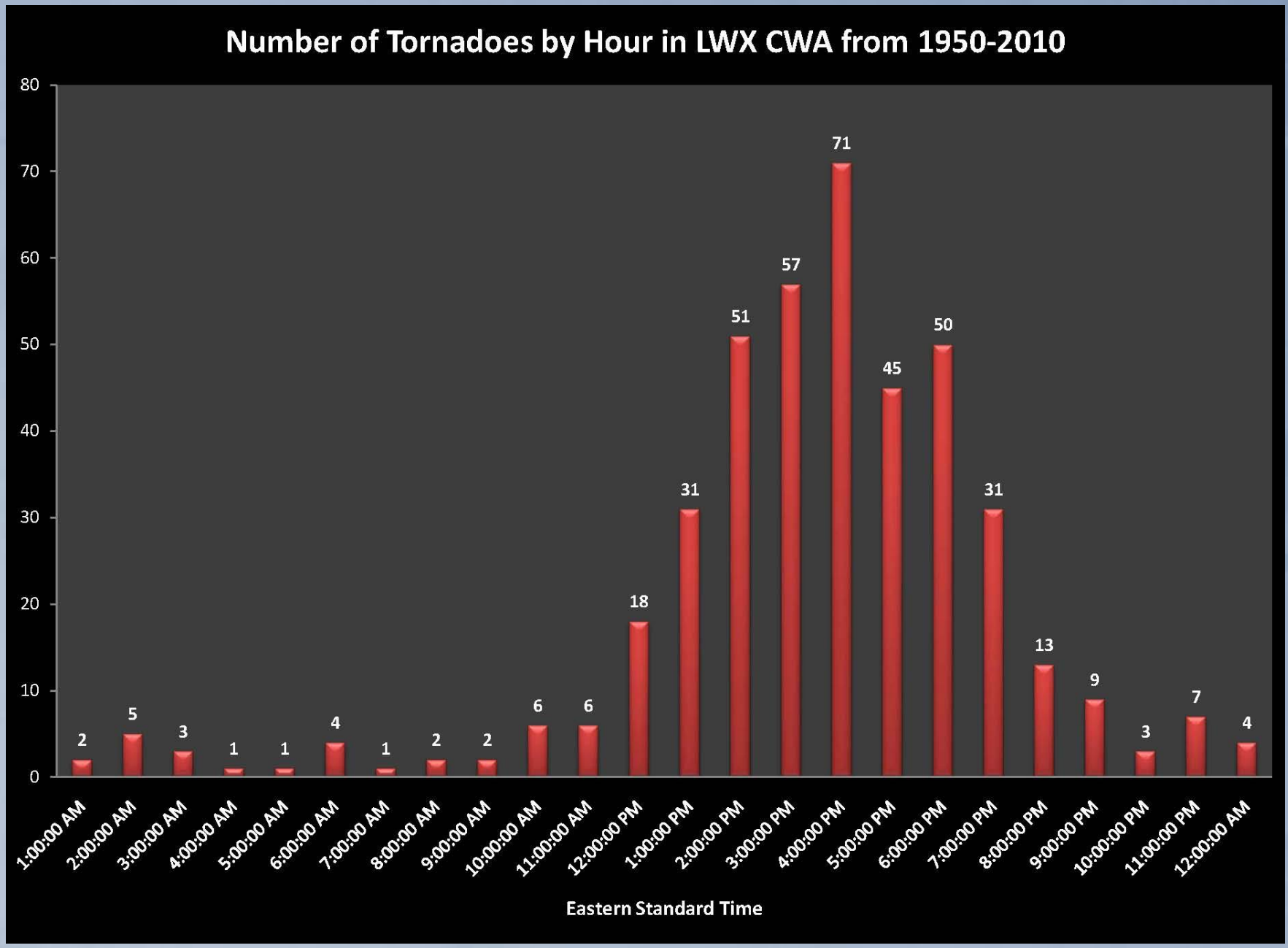
Tornadoes 1950 -2010

- 82% F0 & F1
- 13% F2
- 3% F3
- < .05% F4
- 0 F5

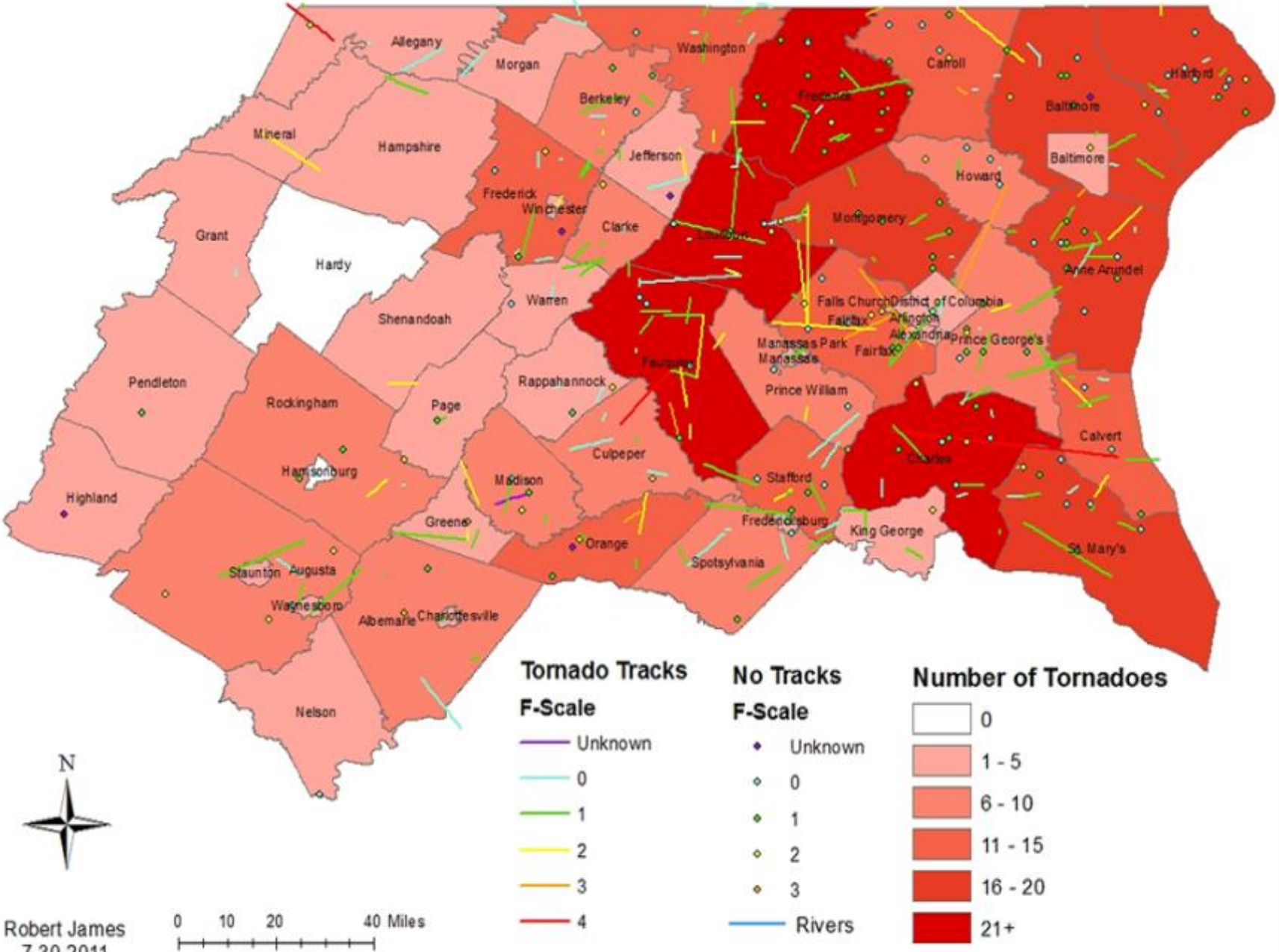
College Park Tornado (F3)
September 24, 2001




LWX CWA Tornado Frequency by Month from 1950-2010
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec

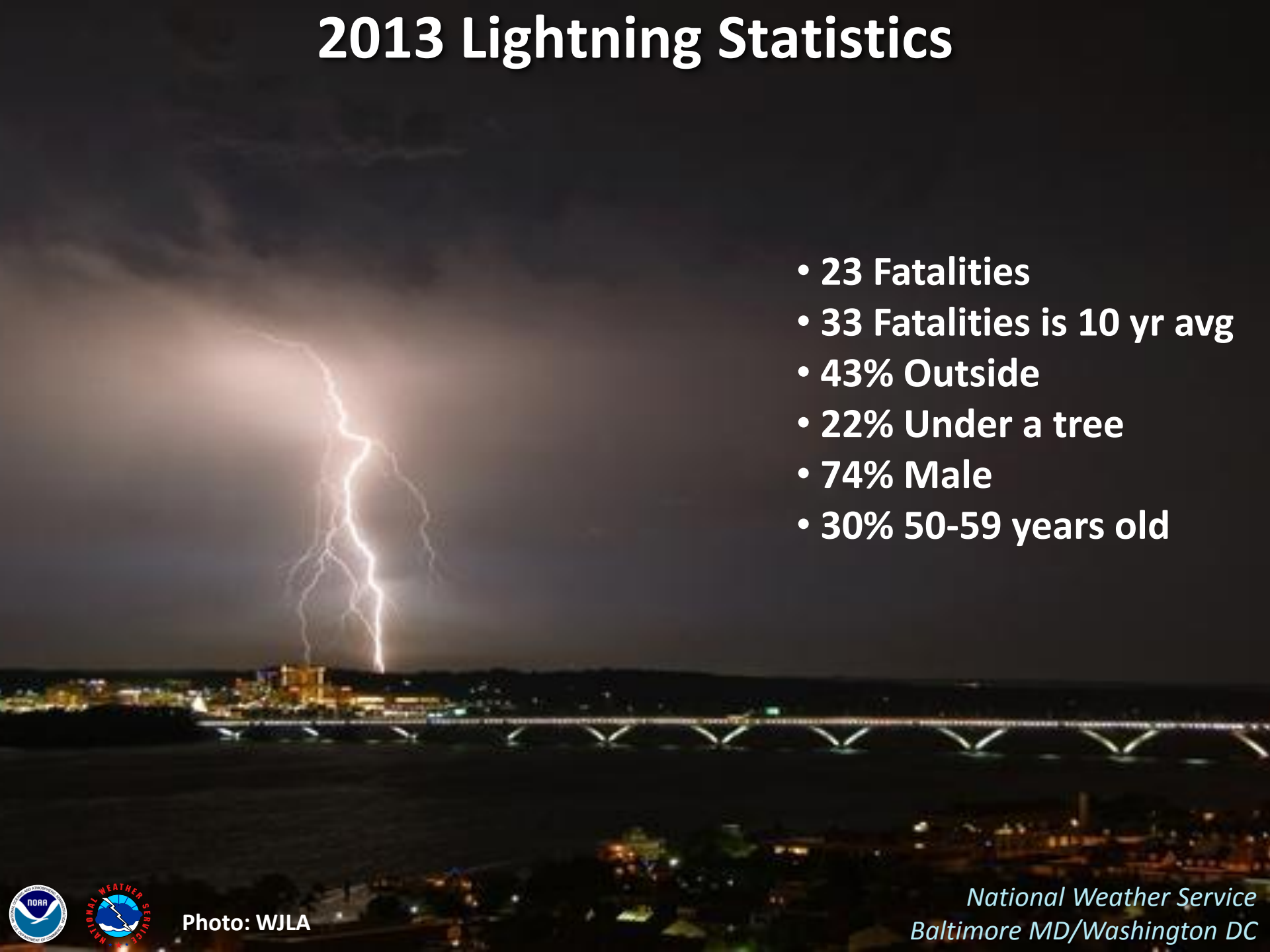

Number of Tornadoes by Hour in LWX CWA from 1950-2010
80
70
60
50
40
30
20
10
0
2
5
3
1
1
4
1
2
2
6
6
18
31
51
57
71
45
50
31
13
9
3
7
4
1:00:00 AM
2:00:00 AM
3:00:00 AM
4:00:00 AM
5:00:00 AM
6:00:00 AM
7:00:00 AM
8:00:00 AM
9:00:00 AM
10:00:00 AM
11:00:00 AM
12:00:00 PM
1:00:00 PM
2:00:00 PM
3:00:00 PM
4:00:00 PM
5:00:00 PM
6:00:00 PM
7:00:00 PM
8:00:00 PM
9:00:00 PM
10:00:00 PM
11:00:00 PM
12:00:00 AM
Eastern Standard Time

CWA LWX Tornado Tracks (1950 - 2010)



Robert James
7-30-2011

2013 Lightning Statistics



- 23 Fatalities
- 33 Fatalities is 10 yr avg
- 43% Outside
- 22% Under a tree
- 74% Male
- 30% 50-59 years old

Photo: WJLA

National Weather Service
Baltimore MD/Washington DC

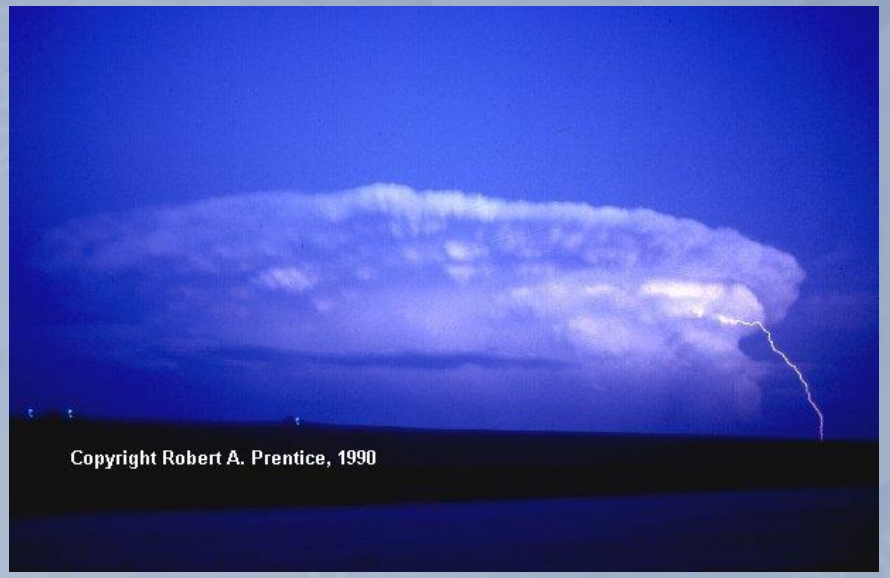
If you can see lightning or hear thunder, you are close enough to be struck and need to take immediate action!!!

National Weather Service
Baltimore MD/Washington DC

Lightning Safety - Outdoors

Seek safe shelter when you first see dark threatening clouds developing, hear thunder or see lightning.

Lightning can come from the upper part of the storm and strike tens of miles away



A safe shelter is:

- **A fully enclosed building with a roof, walls and floor.**
- **A "hard-topped" automobile.**

There is NO safe place to be outside in a thunderstorm!

Lightning Safety - Indoors

Stay Away From:

- Windows and Doors
- Electronic Equipment and Appliances
- Plumbing
- Concrete Floors & Walls

Also:

- Do not use a corded phone.
- Unplug expensive electronics or install surge protectors.

Flooding

Flash Flood: A flood that follows ***within 6 hours*** of a heavy or excessive rainfall, dam or levee failure, or a sudden release of water impounded by an ice jam. **Flash Floods cause more deaths than tornadoes or lightning (30 year period)!**

Flood: A flood that occurs ***more than 6 hours*** after the heavy or excessive rainfall event. Includes both river and stream flooding.

Flooding Safety

Photo: Washington Post/Matt McClain

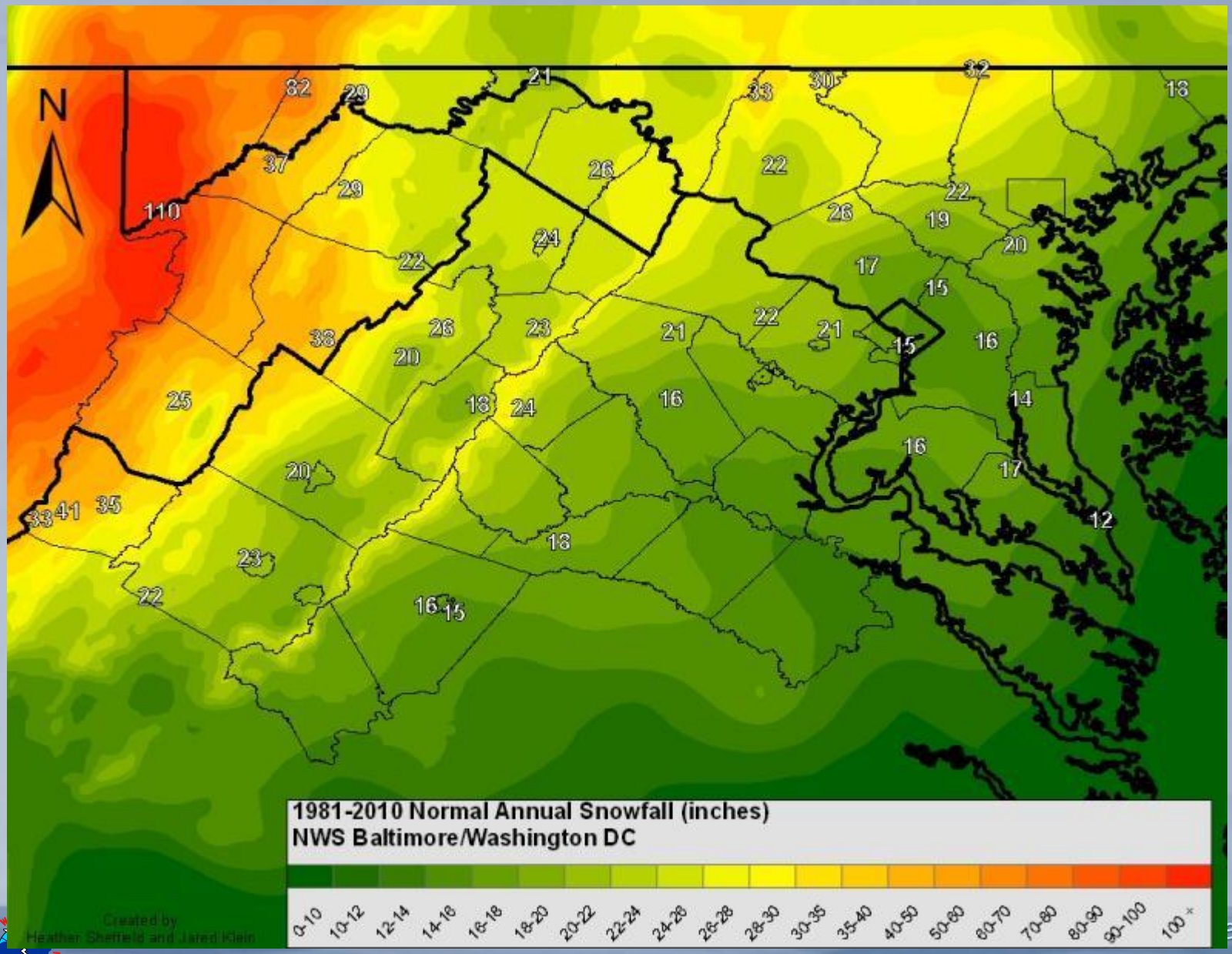
- 45% of the flood fatalities in 2013 were the result of people attempting to drive through flooded roadways. **1 flood related death in MD in 2013**

- If your vehicle stalls in unexpected high water, leave it at once and seek higher ground.

- Never enter water over a road if it is too deep to see the pavement.

- Be very careful at night. Visibility is greatly reduced and flooding is harder to recognize.

Winter Weather



Winter Weather

- Heavy Snow
- Blizzard Conditions
- Icing
- Extreme Cold

Photo Courtesy: Washington Examiner

SUPER BOWL (& CABIN) FEVER
IN SPORTS: GAME PREVIEW AND ANALYSIS · LIVE UPDATES ONLINE: WASHINGTONPOST.COM/SPORTS

The Washington Post

SUNDAY, FEBRUARY 7, 2010

A HISTORIC MESS

POWERLESS: Officials across area consider opening shelters for tens of thousands without heat.

STALLED: 32 inches of snow shutters Dulles; other airports, rail and roads still struggling to dig out.

GOING NOWHERE FAST

Plowing, outages will keep plans on ice

In whiteout, many things come to standstill

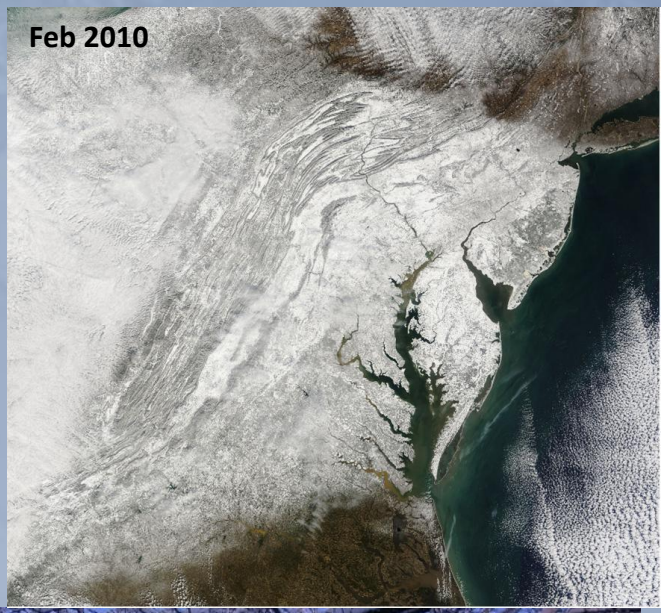
With speech, Palin bounds back on the political stage

Hall of Fame makes way for a 'Hog'

Photo: Washington Post

2013 Winter Weather Statistics

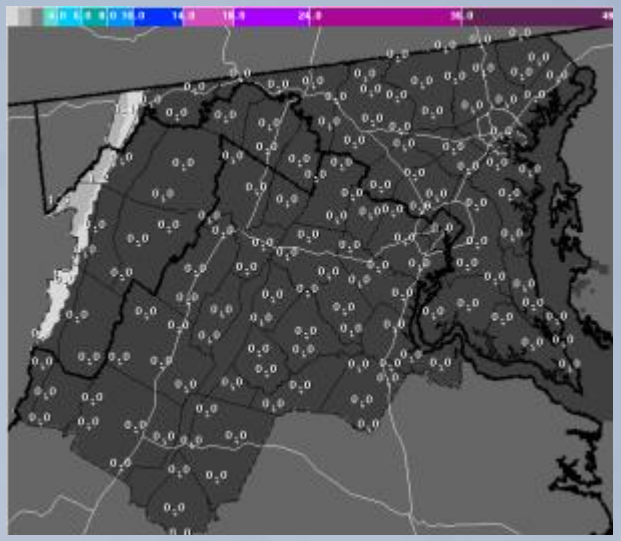
- 21 Fatalities (nation wide)
- 38% deaths occurred in a vehicle
- 67% of the fatalities were female



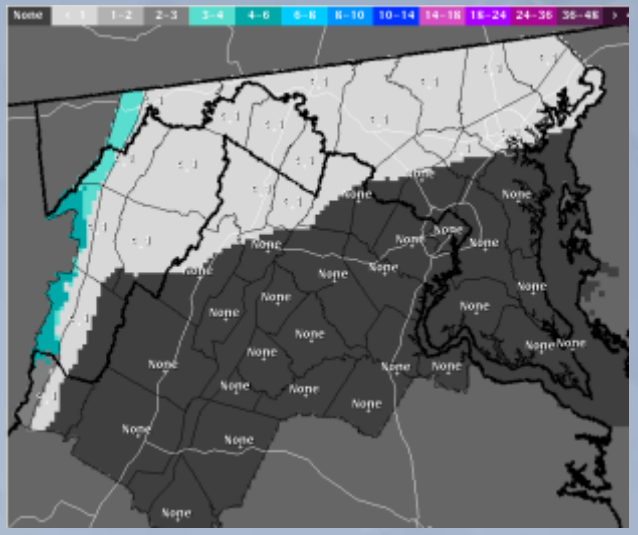
NWS Products & Services

Winter Weather Page

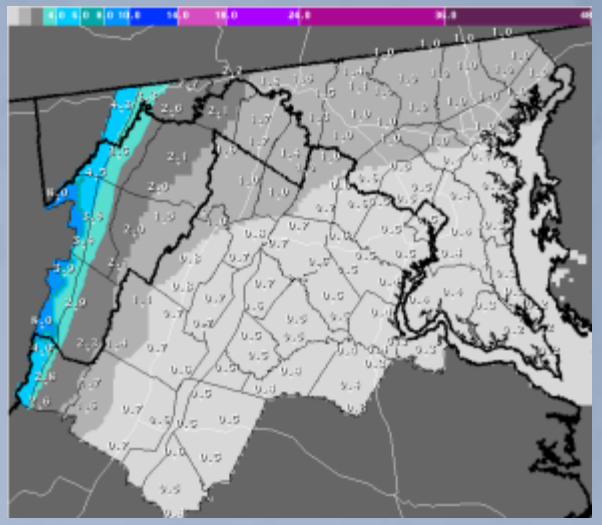
Winter Probabilistic Graphics



Minimum – Expect at least this much

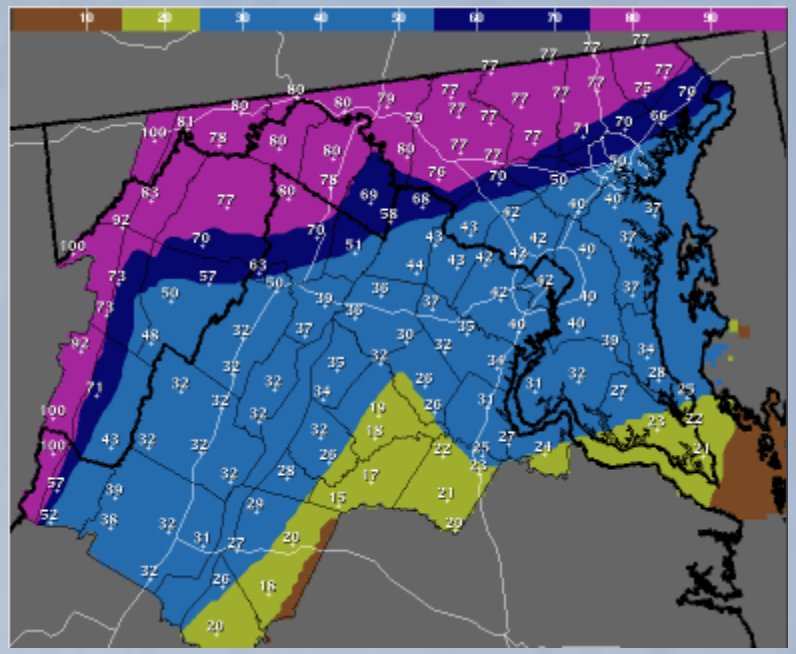


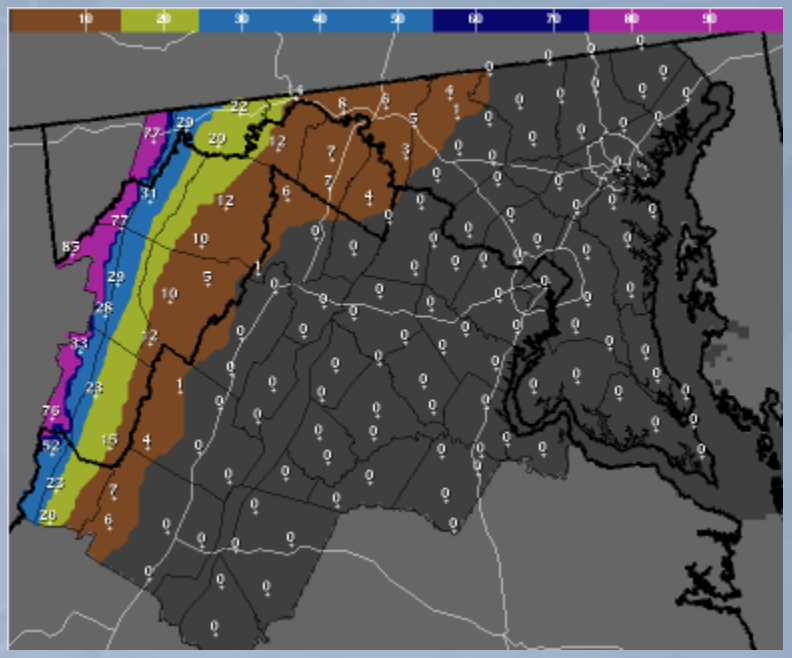
Most Likely Forecast



Maximum – Potential for this much

Winter Probabilistic Graphics





Chance that Snow Accumulations Will Be Greater Than…

- **Trace, 1, 2, 4, 8, 12, 18 inches**

Snowfall Reporting & Measurement

- Measure with a ruler
- Ice Accumulation – any Surface its accumulating on
- Thickness adequate
- Snowfall Measurements
- First two inches six hours – cleaning more often
- Over two inches or so can lead to inaccurate measurements
- Is it measured or estimated?
- If drifting becomes a problem, take several measurements and average them.

Frequency of Measurements

- Every two to three hours is adequate
- Clean off your snowboard every six hours – cleaning more often
- Phone
- Email

Please report your STORM TOTAL snowfall to the nearest tenth of an inch after the event is over.

January 1996

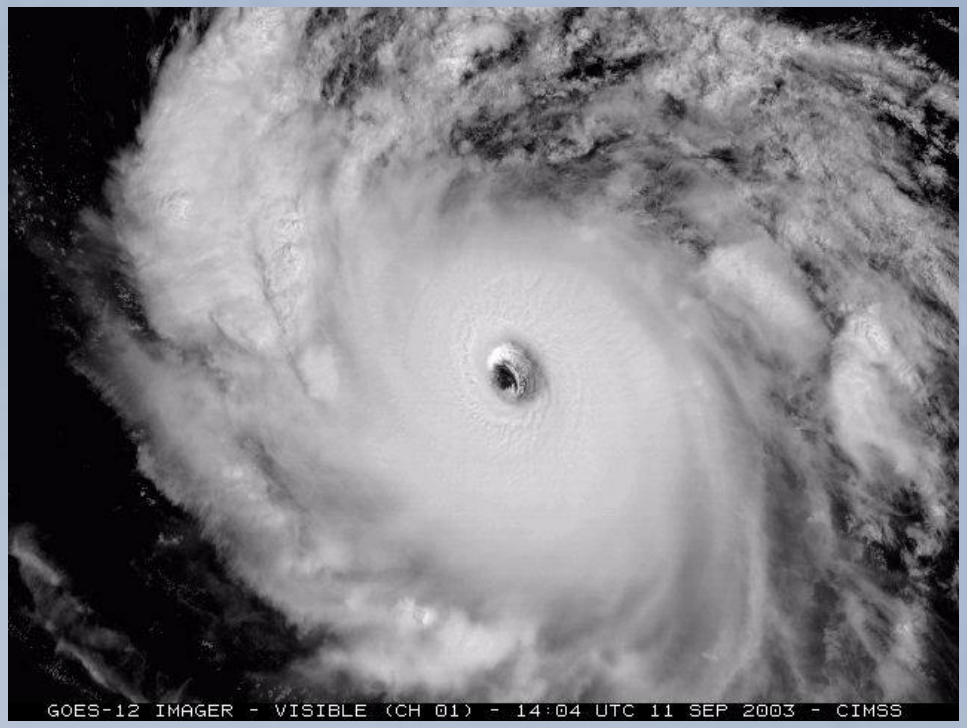
Snowfall Reporting & Measurement

Ideally, a snowboard is the best measuring surface.

- **Can be as simple as a 2 ft square piece of plywood painted white**
- **May want to place flags/markers near the board to help locate during snowy weather**
- **You can measure snow on a table if you don't have a board**

Tropical Weather

Hurricane Season is from June 1 –November 30



Hurricane Isabel

FOUR Threats:

- Inland Flooding (Rain)
- Storm Surge (Tidal)
- High Wind
- Tornadoes

Reporting Criteria Review

- **Tornado or Funnel**
- **Hail – Pea sized or larger**
- **Rotation within a storm**
- **Wind – 50 MPH or greater (sustained/gust and measured/estimated)**
- **Damage – Any weather related damage to trees or property. Give as many details as possible.**

Reporting Criteria Review

- **Heavy Rain** – Measured 1” or More
- **Flooding** – Streams, creeks or rivers out of banks of flooding of roads from poor drainage (including coastal flooding)


Photo By: Ann Linden


Photo By: Jan Livingston, Flickr

- **Ice Accumulation** – Any glaze on surfaces
- **Snow Accumulation** – Every 2” or any accumulation not reflected in the forecast

Very Important Information

If your report is severe thunderstorm hail/wind/tornado/funnel cloud or flooding related, please NO NOT send your report via email!

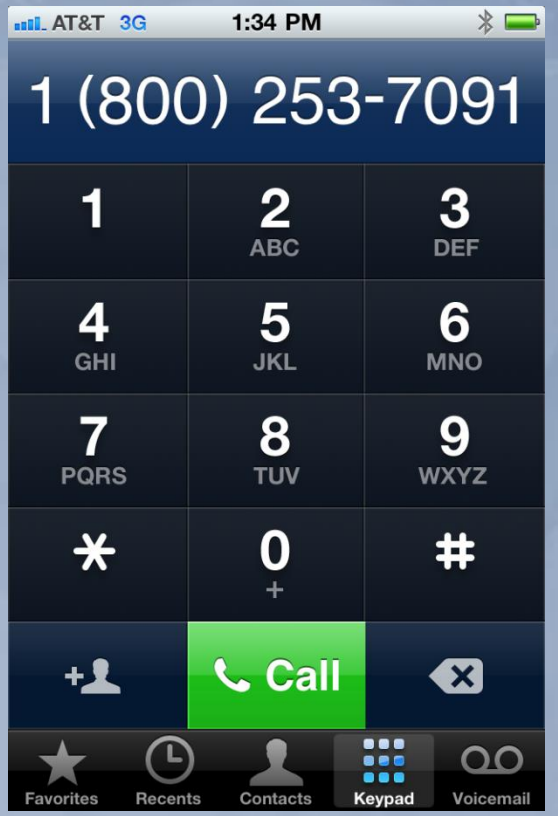
This type of information is time critical and needs to be relayed to forecasters *immediately*.

The best means to get information to the NWS quickly is by the telephone or Amateur Radio

PLEASE DON'T WAIT FOR US TO CALL YOU!

Making a Report

- Include your **full name and Spotter Number**!
- What are you reporting?
- What time was the event?
- Where did the event occur?



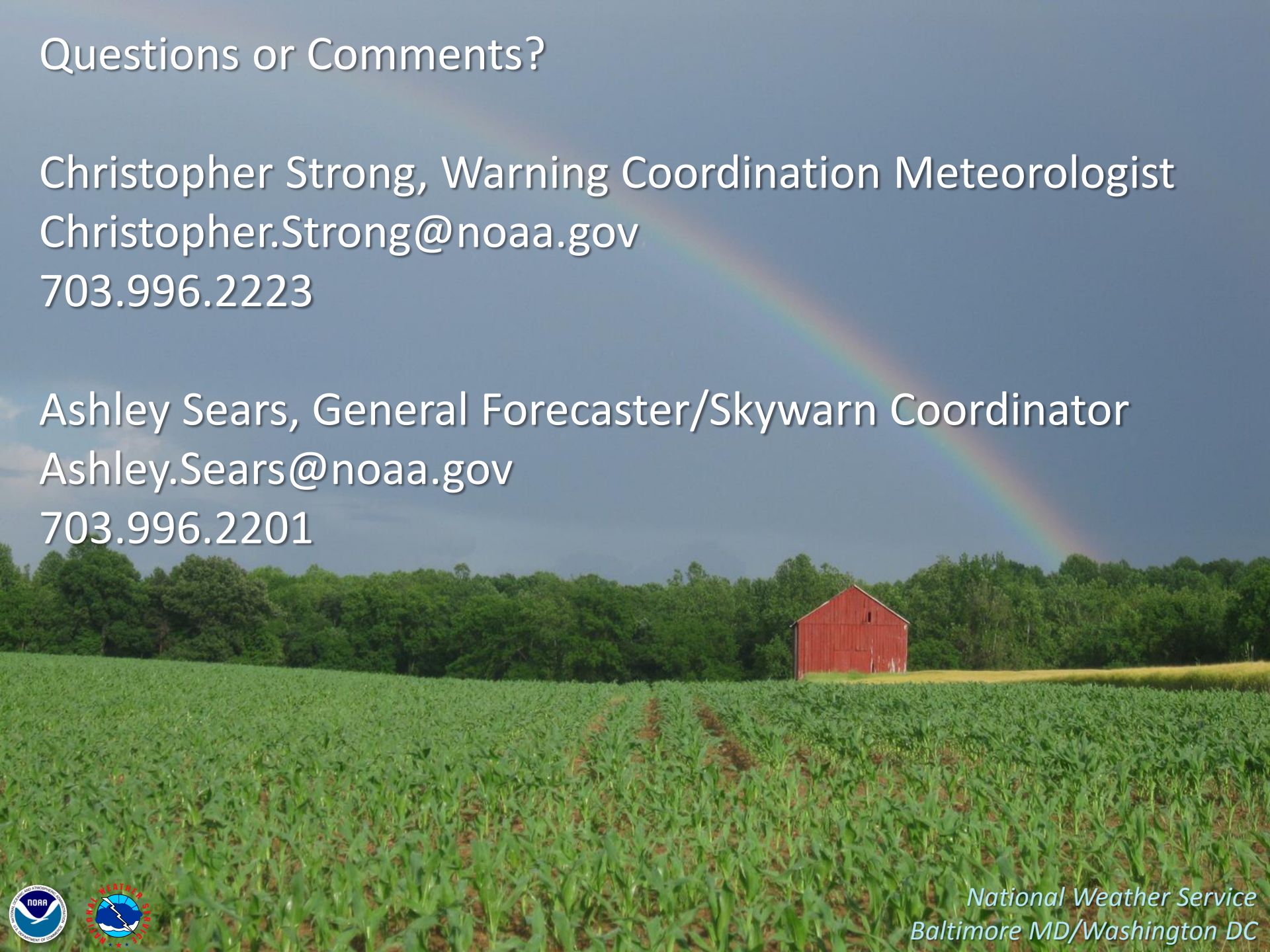
The more specific you are the better!

Email delayed reports, call in the rest!

Questions or Comments?

Christopher Strong, Warning Coordination Meteorologist
Christopher.Strong@noaa.gov
703.996.2223

Ashley Sears, General Forecaster/Skywarn Coordinator
Ashley.Sears@noaa.gov
703.996.2201



National Capital Area Skywarn Support Group

Amateur radio volunteers helping NWS Sterling, Virginia in its mission to protect life and property.

Amateur Radio Relay League (ARRL)
National Weather Service (NOAA-NWS)
Memorandum of Understanding

ARRL volunteers (HAMS) coordinate their services, facilities and equipment with NWS in support of nationwide, state and local early weather warning and emergency communications functions … to enhance the nationwide posture of early weather warning and readiness for any conceivable weather emergency.

The Role of Amateur Radio

Our Mission

Move time-critical spotter reports to the NWS Forecasters by the most expedient means possible.

Assist NWS by seeking out reports from areas where severe weather is occurring or thought to have occurred.

Sterling Skywarn Program

- We use Amateur Radio as our primary means of reporting severe weather to the forecasters in real time.

- This is primarily done on VHF FM repeaters, but we have also used Echolink, APRS, Packet, UHF, HF, and VHF Simplex.

- In addition, we have used instant messaging, when the need was great enough.

Why Amateur Radio?

- There are over 170,000 amateur radio operators in the United States, many of them trained SKYWARN spotters.
- Amateur radio doesn't rely on commercial communications infra-structure.
- Spotters using amateur radio are able to transmit reports to the NWS, when other communication methods fail.

Amateur Radios

Hand Held UHF/VHF Transceivers
Single and Multi Band UHF/VHF Mobile Transceivers
Multi Band High Frequency Transceivers

Mobile Radios

What We Do:

We work directly with the Forecasters at the Sterling Weather Forecast Office (WFO) to provide *real time*, *ground truth* about severe weather events happening within the County Warning Area (CWA).

Amateur Radio Supports:

- Severe Thunderstorms and Tornadoes
- Hurricane and Tropical Storm Watches and Warnings and the remnants of those systems
- Flash Flood Watches and Warnings
- Winter Storm Watches and Warnings

Amateur Radio Does This Through:

- Operation of WX4LWX at NWS Sterling, VA
- Directed Nets on Local Repeaters
- Use of “Report Mode” to gather reports during less intense weather events

Skywarn Desk
NWS Baltimore/Washington

- 2 VHF Radios – 144-148 MHz
- UHF Radio – 440-450 MHz
- HF Radio – 1.8-30 MHz

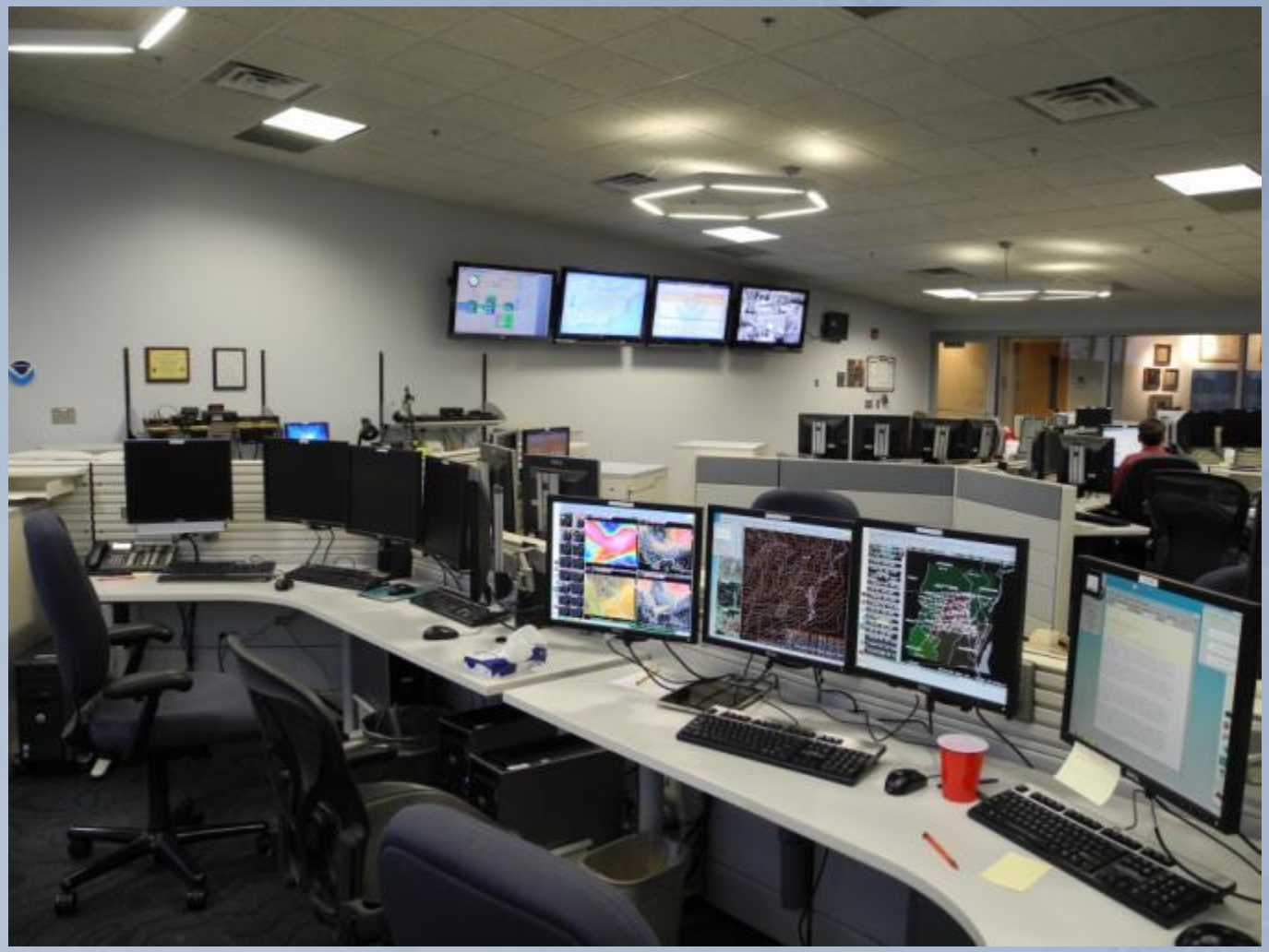
- APRS on VHF at 144.390 MHz
-
- Echolink

- Desktop Computer

This radio station was funded by a grant from the National Capitol Foundation for Amateur Radio (FAR)

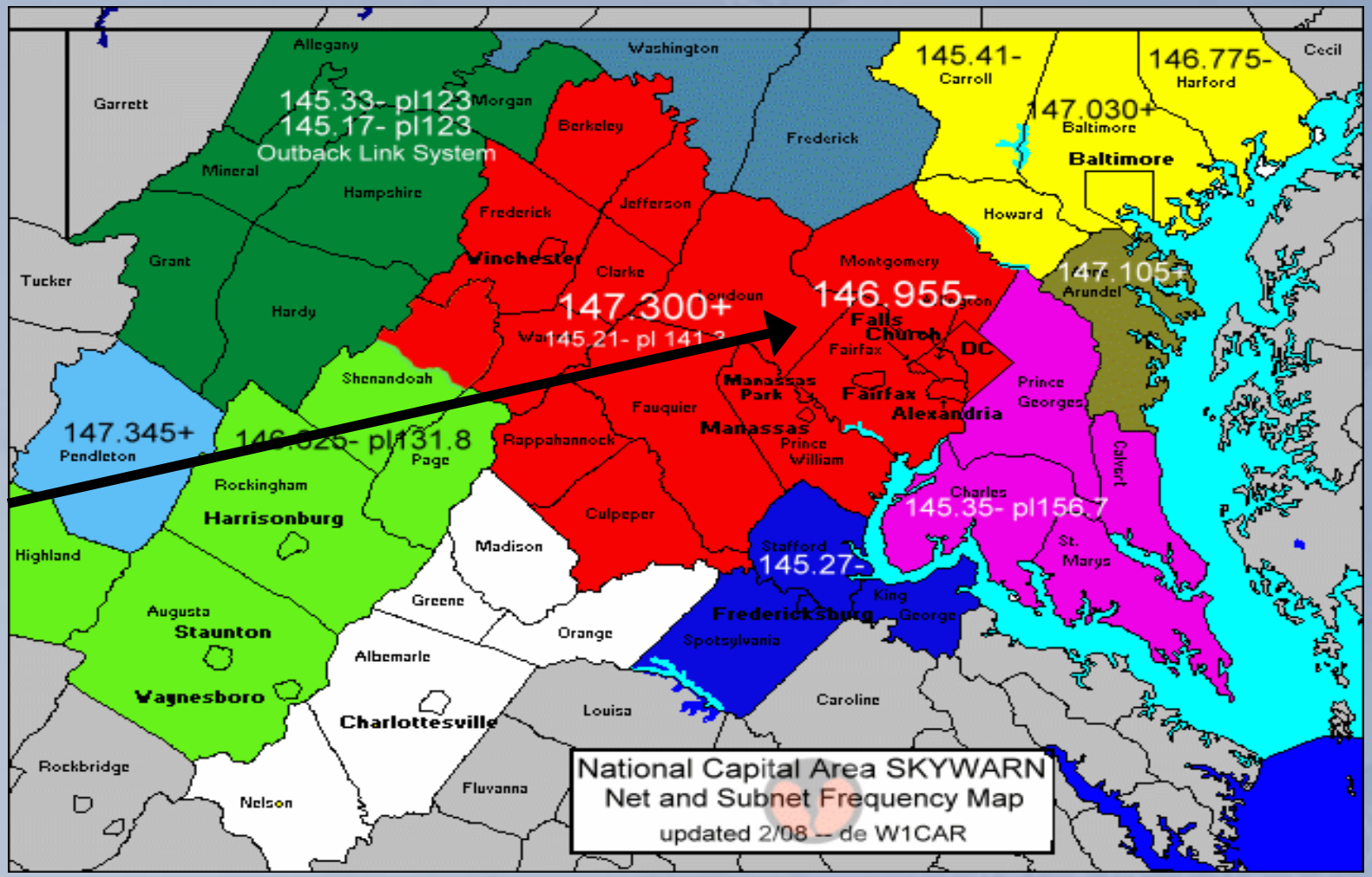
WX4LWX

NWS Baltimore/Washington



County Warning Area

WX4LWX



Real Time Communications

- Main SKYWARN Net – 147.300 Mhz (Bluemont)
  Backup Net – 146.955 Mhz (Rockville)
  Backup Net – 145.210 Mhz (High Knob)
  Subnets – those reachable throughout the CWA
- Hurricane Watch Net – 14.325 Mhz
- Old Dominion Emergency Net – 3.947 Mhz
  Virginia Digital Emergency Net – 3.578.5 Mhz
- Local ARES/RACES/Red Cross nets and adjacent State Emergency Nets.
- Communication with adjacent SKYWARN support groups if required.

Also…

- **Any licensed amateur may report severe weather through the amateur radio nets.** **We require that reports meet severe weather criteria.**

- **Many amateur radio SKYWARN spotters are also members of ARES, RACES and other emergency response groups.**

- **Amateur radio operators may be called on to perform emergency communications and damage assessment support in addition to our SKYWARN mission.**

Movement of Information

Skywarn Spotters

Amateur Radio Net

WX4LWX (when active, phoned in when not)

NWS Forecasters

National Weather Service National Capital Area Skywarn Support Group

Tim Dennison, AI4TD - Amateur Radio Coordinator

Virginia Legowik, AK4EA - Assistant Coordinator

Rob Seastrom, AI4UC - Assistant Coordinator

Tom Horne, W3TDH - Assistant Coordinator

Richard Morani, KE4AJL - Assistant Coordinator

… and a cast of thousands!!

Does It Work?

Joplin, MO May 22, 2011
SKYWARN
Emergency Communications
Red Cross/Local Agencies
ARES/RACES Support
Statewide Coordination

For More Information

- Scanner listeners are invited to tune to their local amateur radio net frequency.
- Anyone can monitor our primary frequency via live audio on the Web

www.radioreference.com/virginia/fairfax_county
weather.gov/washington/skywarn/skywarn.htm
www.wx4lwx.org